

# Impact Of Vamana Karma on Metabolic Syndrome: A Clinical Perspective

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**Abstract**—Metabolic Syndrome (MetS) is a complex metabolic disorder characterized by a cluster of interrelated conditions including central obesity, insulin resistance, dyslipidemia, hypertension, and impaired glucose metabolism. The increasing prevalence of MetS due to sedentary lifestyle, unhealthy dietary habits, and psychological stress has become a major global health concern. Conventional management primarily focuses on lifestyle modifications and pharmacotherapy; however, long-term outcomes are often limited by poor compliance and adverse effects. Ayurveda offers a holistic approach to the management of metabolic disorders by addressing their root causes. From an Ayurvedic perspective, Metabolic Syndrome can be correlated with Santarpanajanya Vyadhi, Sthoulya, and Medoroga, wherein Kapha-Meda Vriddhi, Agnimandya, Ama formation, and Srotorodha play pivotal roles in disease pathogenesis. Vamana Karma, one of the principal Panchakarma procedures, is regarded as the foremost therapeutic intervention for Kapha-dominant disorders. By eliminating vitiated Kapha and excessive Meda, Vamana Karma helps restore Agni, clear obstructed channels, and improve metabolic functions. Contemporary studies have demonstrated beneficial effects of Vamana Karma on body weight, body mass index, waist circumference, lipid profile, and insulin sensitivity. Additionally, it may contribute to the reduction of systemic inflammation and enhancement of overall metabolic homeostasis.

The present review aims to critically analyze the role of Vamana Karma in the management of Metabolic Syndrome through an integrative assessment of classical Ayurvedic concepts and available clinical evidence. The review highlights the potential of Vamana Karma as a safe, effective, and holistic metabolic corrective therapy capable of addressing both the manifestations and underlying pathology of Metabolic Syndrome.

**Index Terms**—Metabolic Syndrome, Vamana Karma, Ayurveda, Panchakarma, Santarpanajanya Vyadhi, Medoroga, Sthoulya, Kapha-Meda Vriddhi, Agnimandya, Insulin Resistance, Dyslipidemia.

## I. INTRODUCTION

Metabolic Syndrome (MetS) is a complex metabolic disorder characterized by a cluster of interrelated abnormalities, including central obesity, insulin resistance, dyslipidemia, hypertension, and impaired glucose metabolism. It has become one of the most significant global public health concerns because of its rapidly increasing prevalence and its strong association with type 2 diabetes mellitus, cardiovascular diseases, non-alcoholic fatty liver disease (NAFLD), and premature mortality. The rising incidence of sedentary lifestyles, unhealthy dietary habits, urbanization, and psychosocial stress has further accelerated the burden of Metabolic Syndrome worldwide, particularly in developing countries.<sup>1-3</sup>

The pathophysiology of Metabolic Syndrome is multifactorial and is primarily driven by insulin resistance, visceral adiposity, chronic low-grade inflammation, and oxidative stress. Excess visceral adipose tissue functions as an active endocrine organ that secretes various adipokines and inflammatory mediators, including tumour necrosis factor-alpha (TNF- $\alpha$ ) and interleukin-6 (IL-6), which contribute to impaired insulin signalling, endothelial dysfunction, dyslipidemia, and progressive metabolic derangements. These pathological changes substantially increase the risk of cardiovascular

morbidity and mortality, making Metabolic Syndrome a major challenge for healthcare systems worldwide.<sup>4,5</sup>

Although considerable advances have been made in the management of Metabolic Syndrome, conventional treatment mainly focuses on controlling its individual components through lifestyle modification and pharmacological interventions. Such approaches are effective in reducing specific risk factors but often fail to address the underlying metabolic dysfunction responsible for disease progression. Consequently, there is an increasing interest in holistic therapeutic strategies that can restore metabolic balance while preventing long-term complications.

Ayurveda describes health as a state of equilibrium among Dosha, Dhatu, Agni, and Srotas. While Metabolic Syndrome is not mentioned as a distinct disease entity in the classical Ayurvedic texts, its clinical manifestations and etiopathogenesis closely resemble Santarpanajanya Vyadhi, Sthoulya, and Medoroga. Excessive consumption of Guru, Snigdha, Madhura, and Santarpana Ahara, together with Avyayama (physical inactivity), Divaswapa (day sleep), and other Kapha-provoking lifestyle factors, leads to Kapha-Meda Vriddhi, Agnimandya, Ama formation, and Medovaha Srotodushti. These pathological events result in abnormal accumulation of Meda Dhatu, impaired metabolism, and systemic manifestations that closely parallel the modern understanding of Metabolic Syndrome.<sup>6</sup>

Among the Panchakarma procedures, Vamana Karma is regarded as the principal Shodhana therapy for Kapha-predominant disorders. By eliminating aggravated Kapha Dosha, reducing excessive Meda, correcting Agni, and clearing obstructed Srotas, Vamana Karma helps restore metabolic homeostasis. Classical Ayurvedic texts recommend Vamana in conditions such as Sthoulya, Medoroga, and Prameha, highlighting its potential role in the management of metabolic disorders. Emerging clinical evidence also suggests that Vamana Karma may improve body weight, body mass index, waist circumference, lipid profile, and insulin sensitivity, indicating its promising role as a comprehensive metabolic corrective therapy. Therefore, the present review aims to critically evaluate the impact of Vamana Karma in the management of Metabolic Syndrome by integrating

classical Ayurvedic concepts with contemporary scientific evidence.<sup>7-8</sup>

## II. METABOLIC SYNDROME: MODERN PERSPECTIVE

Metabolic Syndrome (MetS) is a cluster of metabolic abnormalities characterized by central obesity, insulin resistance, hypertension, dyslipidemia, and impaired glucose metabolism. The coexistence of these abnormalities markedly increases the risk of developing type 2 diabetes mellitus, cardiovascular disease, stroke, and non-alcoholic fatty liver disease (NAFLD).<sup>9</sup>

The syndrome develops through a complex interaction of genetic predisposition, unhealthy dietary habits, obesity, physical inactivity, and psychosocial stress. Among these factors, insulin resistance is considered the key pathogenic mechanism. Reduced responsiveness of peripheral tissues to insulin leads to impaired glucose uptake, compensatory hyperinsulinaemia, altered lipid metabolism, endothelial dysfunction, and progressive metabolic derangements, thereby increasing the risk of cardiovascular complications.<sup>9,10</sup>

Visceral adipose tissue functions as an active endocrine organ by secreting adipokines and inflammatory mediators such as tumour necrosis factor-alpha (TNF- $\alpha$ ), interleukin-6 (IL-6), leptin, and resistin. These mediators induce chronic low-grade inflammation and oxidative stress, which further aggravate insulin resistance and accelerate disease progression. Persistent inflammation also contributes to vascular dysfunction and the development of atherosclerosis.<sup>10</sup>

According to the National Cholesterol Education Program Adult Treatment Panel III (NCEP ATP III), Metabolic Syndrome is diagnosed when any three or more of the following criteria are present:

| Parameter             | Diagnostic Criteria                |
|-----------------------|------------------------------------|
| Waist circumference   | >102 cm (Men), >88 cm (Women)      |
| Triglycerides         | $\geq 150$ mg/dL                   |
| HDL cholesterol       | <40 mg/dL (Men), <50 mg/dL (Women) |
| Blood pressure        | $\geq 130/85$ mmHg                 |
| Fasting blood glucose | $\geq 100$ mg/dL                   |

The prevalence of Metabolic Syndrome has increased considerably over the past few decades, particularly in developing countries due to rapid urbanization, unhealthy dietary habits, reduced physical activity, and increasing obesity. Consequently, Metabolic Syndrome has become a major contributor to the global burden of non-communicable diseases.<sup>11</sup>

Current management primarily includes dietary modification, regular physical activity, weight reduction, and pharmacological therapy for hypertension, dyslipidemia, and hyperglycaemia. Although these interventions effectively control individual risk factors, they often fail to address the underlying metabolic dysfunction.

Therefore, there is a growing need for holistic therapeutic approaches that target the root pathophysiology and restore metabolic homeostasis.

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### III. AYURVEDIC PERSPECTIVE OF METABOLIC SYNDROME

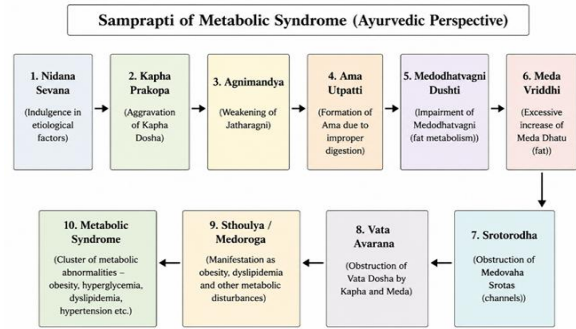
Metabolic Syndrome is not described as a distinct disease entity in the Ayurvedic classics; however, its clinical manifestations and etiopathogenesis closely resemble Santarpanajanya Vyadhi, Sthoulya, and Medoroga.

Excessive consumption of Guru, Snigdha, Madhura, and Santarpana Ahara, along with Avyayama (lack of physical activity), Divaswapa (day sleep), and sedentary lifestyle, leads to aggravation of Kapha Dosha and excessive accumulation of Meda Dhatu.<sup>12</sup>

Continuous indulgence in these etiological factors results in Jatharagnimandya and Medodhatvagnimandya, leading to the formation of Ama. The accumulated Ama, along with aggravated Kapha and Meda, obstructs the Medovaha Srotas, causing Srotorodha and disturbing the normal movement of Vata Dosha.

This pathological cascade ultimately manifests as obesity, dyslipidemia, impaired metabolism, and other metabolic abnormalities comparable to Metabolic Syndrome.<sup>12,13</sup>

The Ayurvedic Samprapti of Metabolic Syndrome can be summarized as follows:



The major Samprapti Ghatakas involved are:

- Dosha: Kapha (predominant), Vata (secondary)
- Dushya: Meda, Rasa, Mamsa
- Agni: Jatharagni Mandya and Medodhatvagni Mandya
- Srotas: Medovaha Srotas
- Srotodushti: Sanga (obstruction)
- Udbhavasthana: Amashaya
- Vyaktasthana: Sarva Sharira

Thus, the fundamental pathology of Metabolic Syndrome in Ayurveda is characterized by Kapha-Meda Vriddhi, Agnimandya, Ama formation, and Medovaha Srotodushti. Therefore, the treatment should focus on eliminating aggravated Kapha, correcting Agni, digesting Ama, reducing excessive Meda, and restoring the normal function of Medovaha Srotas through appropriate Shodhana and Shamana therapies.<sup>14</sup>

### IV. CONCEPT OF VAMANA KARMA AND ITS RELEVANCE IN METABOLIC SYNDROME

Vamana Karma is one of the five principal Shodhana procedures described under Panchakarma Chikitsa and is regarded as the foremost therapeutic intervention for the elimination of aggravated Kapha Dosha. According to Acharya Charaka, Vamana is the treatment of choice for Kapha-pradhana disorders and diseases originating from the Amashaya, as it expels vitiated Kapha through the upper gastrointestinal tract, thereby restoring the equilibrium of Doshas and improving physiological functions.<sup>15</sup> From an Ayurvedic perspective, the pathogenesis of Metabolic Syndrome predominantly involves Kapha-Meda Vriddhi, Agnimandya, Ama formation, and Medovaha Srotodushti. Excessive intake of Guru, Snigdha, and Madhura Ahara, along with sedentary habits and lack

of physical activity, leads to the accumulation of Kapha and Meda. This results in impaired digestion and metabolism, ultimately producing obesity, dyslipidemia, insulin resistance, and other metabolic abnormalities. Since Vamana Karma directly eliminates aggravated Kapha and reduces excessive Meda, it plays a pivotal role in interrupting the disease process at its root.<sup>15,16</sup> Classical Ayurvedic texts recommend Vamana Karma in diseases such as Sthoulya, Medoroga, Prameha, Kapha Vriddhi, Agnimandya, and other Santarpanajanya Vyadhi, all of which exhibit similarities with the clinical manifestations of Metabolic Syndrome. Therefore, Vamana Karma can be considered a rational therapeutic approach for correcting metabolic derangements associated with these conditions.<sup>15</sup>

The therapeutic objectives of Vamana Karma in Metabolic Syndrome include:

- Elimination of aggravated Kapha Dosha
- Reduction of excessive Meda Dhatu
- Restoration of Jatharagni and Dhatvagni
- Elimination of Ama
- Purification of Medovaha Srotas
- Improvement in metabolic efficiency
- Prevention of disease progression and associated complications

By acting simultaneously at the levels of Dosha, Agni, Dhatu, and Srotas, Vamana Karma not only relieves the clinical manifestations of Metabolic Syndrome but also corrects its underlying pathogenesis. This multidimensional therapeutic action distinguishes Vamana Karma from symptomatic treatment and supports its role as a comprehensive metabolic corrective therapy in Ayurveda.<sup>15-17</sup>

#### V. MECHANISM OF ACTION OF VAMANA KARMA IN METABOLIC SYNDROME

The therapeutic efficacy of Vamana Karma in Metabolic Syndrome can be explained through both classical Ayurvedic principles and contemporary biomedical concepts. Since the disease is predominantly characterized by Kapha-Meda Vriddhi, Agnimandya, Ama formation, and Medovaha Srotodushti, Vamana Karma directly acts on these fundamental pathological factors. By eliminating aggravated Kapha Dosha, restoring Agni, and

promoting Srotoshodhana, it helps re-establish metabolic balance and prevents further disease progression.<sup>18</sup>

#### Action on Dosha

According to Ayurveda, Kapha Dosha plays a major role in the pathogenesis of Santarpanajanya Vyadhi. Excessive consumption of Guru, Snigdha, and Madhura Ahara, along with physical inactivity, leads to Kapha aggravation and excessive Meda accumulation. Vamana Karma eliminates vitiated Kapha from its principal site (Amashaya), thereby reducing the pathological burden and restoring Dosha Samyata. This helps arrest the disease process at its origin.<sup>15,18</sup>

#### Action on Agni and Ama

Agnimandya is the initiating factor in the development of metabolic disorders. Impaired digestive and tissue metabolism leads to the formation of Ama, which obstructs various Srotas and further aggravates metabolic dysfunction. Vamana Karma enhances Jatharagni and Dhatvagni, facilitating proper digestion, absorption, and metabolism while promoting the elimination of Ama. Restoration of Agni ultimately improves tissue nourishment and metabolic efficiency.<sup>15,18</sup>

#### Action on Meda Dhatu

Abnormal accumulation of Meda Dhatu is the hallmark of both Sthoulya and Metabolic Syndrome. Through Kapha Shodhana and correction of Medodhatvagni, Vamana Karma regulates lipid metabolism and reduces excessive fat deposition. Consequently, improvement in body weight, body mass index, and central obesity can be expected following therapy.<sup>18</sup>

#### Action on Srotas

The accumulation of Kapha, Meda, and Ama causes obstruction of the Medovaha Srotas, resulting in impaired transport of nutrients and metabolic waste products. Vamana Karma performs Srotoshodhana, removes obstruction, and restores normal physiological circulation. This improves tissue metabolism and contributes to overall metabolic homeostasis.<sup>18</sup>

### Modern Scientific Perspective

From a contemporary viewpoint, Vamana Karma may influence several metabolic pathways. Clinical observations have reported reductions in body weight, body mass index (BMI), waist circumference, serum triglycerides, total cholesterol, and low-density lipoprotein (LDL) following Vamana therapy. Improvement in insulin sensitivity and reduction in chronic inflammatory activity have also been observed, suggesting that Vamana Karma may act as a comprehensive metabolic corrective intervention rather than merely a detoxification procedure.<sup>19</sup>Overall, Vamana Karma exerts multidimensional therapeutic effects by eliminating aggravated Kapha, correcting impaired metabolism, reducing excessive Meda, and restoring the normal function of Agni and Srotas. These integrated actions make it a rational Ayurvedic intervention for the comprehensive management of Metabolic Syndrome.

## VI. CLINICAL EVIDENCE AND DISCUSSION

Metabolic Syndrome has emerged as one of the leading non-communicable diseases worldwide owing to the increasing prevalence of obesity, sedentary lifestyle, unhealthy dietary habits, and psychological stress. Although conventional treatment effectively manages individual components such as hypertension, dyslipidemia, and hyperglycaemia, it often fails to address the underlying metabolic dysfunction responsible for disease progression. This limitation has encouraged the exploration of holistic treatment modalities, including Panchakarma interventions, for comprehensive metabolic correction.

From an Ayurvedic perspective, the pathogenesis of Metabolic Syndrome closely resembles Santarpanjanya Vyadhi, Sthoulya, and Medoroga, where Kapha-Meda Vriddhi, Agnimandya, Ama formation, and Srotorodha are the principal pathological events. Hence, therapies capable of eliminating aggravated Kapha, correcting Agni, reducing Meda, and restoring normal Srotasa function are expected to provide significant therapeutic benefits. Among the Panchakarma procedures, Vamana Karma is regarded as the most appropriate Shodhana therapy for Kapha-dominant disorders. By expelling vitiated Kapha from its principal site, it helps restore Dosha equilibrium, improves Jatharagni and Dhatvagni, facilitates Ama Nirharana, and promotes

Srotoshodhana. These actions collectively improve metabolic functions and help interrupt the pathological cascade responsible for obesity and metabolic disturbances. Recent clinical studies have reported encouraging outcomes following Vamana Karma in patients with obesity and metabolic disorders. Significant reductions in body weight, body mass index (BMI), waist circumference, serum triglycerides, total cholesterol, and low-density lipoprotein (LDL) have been observed after Vamana therapy. Improvement in insulin sensitivity and overall metabolic efficiency has also been documented, supporting the classical Ayurvedic concept that elimination of aggravated Kapha and excessive Meda restores metabolic homeostasis.<sup>20</sup>Another important advantage of Vamana Karma is its preventive potential. Since Metabolic Syndrome develops gradually because of prolonged dietary indiscretions and sedentary lifestyle, early administration of appropriate Shodhana Chikitsa, along with Pathya Ahara, regular physical activity, Yoga, and lifestyle modification, may prevent progression to type 2 diabetes mellitus, cardiovascular disease, and other obesity-related complications. Therefore, Vamana Karma should be considered not merely as a detoxification procedure but as a comprehensive metabolic corrective therapy that addresses both the underlying pathology and clinical manifestations of Metabolic Syndrome. Nevertheless, larger multicentric randomized controlled trials with standardized treatment protocols are required to further validate its efficacy and establish stronger scientific evidence.

## VII. CONCLUSION

Metabolic Syndrome is a multifactorial disorder characterized by obesity, insulin resistance, dyslipidemia, hypertension, and impaired glucose metabolism. From an Ayurvedic perspective, it can be correlated with Santarpanjanya Vyadhi, Sthoulya, and Medoroga, where Kapha-Meda Vriddhi, Agnimandya, Ama formation, and Medovaha Srotodushti constitute the fundamental pathological mechanisms. Vamana Karma, the principal Shodhana therapy for Kapha-predominant disorders, directly addresses these pathological factors by eliminating aggravated Kapha, correcting Agni, reducing excessive Meda, removing Ama, and restoring the

normal function of Medovaha Srotas. Emerging clinical evidence indicates that Vamana Karma may improve anthropometric and metabolic parameters, including body weight, lipid profile, and insulin sensitivity, thereby offering a holistic and promising therapeutic approach for Metabolic Syndrome. Integration of Vamana Karma with appropriate dietary regulation, lifestyle modification, regular exercise, and Yoga may provide a comprehensive strategy for the prevention and management of Metabolic Syndrome. However, further well-designed clinical studies with larger sample sizes are necessary to establish its long-term efficacy and underlying mechanisms.

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