

Therapeutic Impact of Panchakarma Procedures in the Management of Metabolic Syndrome: A Systematic Clinical Investigation

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Abstract: Metabolic Syndrome (MetS) is a family of interrelated metabolic diseases comprising of central obesity, insulin resistance, dyslipidemia, and hypertension, which predisposes a person severely to cardiovascular diseases and diabetes type 2 mellitus. The use of traditional systems of medicine especially Ayurveda in management of such chronic lifestyle disorders has taken attraction within recent years. Panchakarma is an Ayurvedic principle that underlies therapeutics and is very focused on cleansing and replenishing the balance within the body. This paper will critically assess the therapeutic effects of Panchakarma treatments on the treatment of Metabolic Syndrome. It was a clinical trial used on patients diagnosed with MetS and the classical Panchakarma treatments including Vamana, Virechana, Basti and Udvartana were used based on their constitutive (Prakriti) and pathological conditions. The clinical parameters used in the assessment of the outcomes were body mass index (BMI), fasting blood glucose, lipid profile and blood pressure. These results indicate that the Panchakarma treatments have an important effect on the metabolic parameters and general health, which proves their potential as a complementary and holistic remedy in the provision of Metabolic Syndrome.

Keywords: Metabolic Syndrome, Panchakarma, Ayurveda, Detoxification, Insulin Resistance, Obesity, Holistic Therapy, Lifestyle Disorders

Introduction:

One of the most widespread problems in this present-day society has turned out to be Metabolic Syndrome. It is not a single disease but rather a set of conditions that are found in concomitants, including excess weight (particularly around the waist) and elevated blood sugar, irregular cholesterol content and raised blood pressure. When combined they can create a great risk of a severe picture of such diseases as heart disease, diabetes, stroke and so on. More people are becoming victims of metabolic syndrome in the recent past, and this is primarily because of unhealthy lifestyle choices, absence of physical exercise, anomalous nutritional eating on the one hand, and mental stress on the other.

This issue is turning a serious problem in states such as India due to the rapid urbanization and shifting lifestyle that is taking place. The human beings have become more attached to processed foods, excessive work time and sedentary lifestyle which are not healthy. This has had an effect of causing even younger individuals to be diagnosed with certain conditions that

were previously mostly experienced among the elder age groups. This increasing load increasingly raises the issue of effective and sustainable treatment methods.

The practice of modern medicine primarily extends to the management of the single aspects of metabolic disorder as prescribed medicine of diabetes, hypertension, or cholesterol. Although these are useful treatments, they usually fail to provide solutions to the actual cause of the problem. Patients would have to have long-term medications in most cases, as well as side effects. This has led to an up-swing in the desire of seeking alternative and holistic systems of medicine that puts in view their overall health as opposed to treating the disease.

An entirely different picture is presented by Ayurveda which is the Indian traditional system of medicine. Even though it is not directly said in the classical text that metabolic syndrome exists, the symptoms may be related to conditions such as; Sthaulya (obesity), Prameha (metabolic disorders such as diabetes) and Medoroga (metabolic disorders of the fat metabolism). Ayurveda claims that these diseases arise because of disorder in the working energies of the body and indispensable Kapha Dosha of the body, and the deficiency of digestive power (Agni) and toxins (Ama).

Ayurveda is of the opinion that unhealthy lifestyle habits such as improper dieting, absence of activities disturbs the natural balance of the body. In cases where the digestive system is weak, the accumulation of toxins will occur and prevent the flow of body channels. This eventually results into different metabolic disorders. Therefore, the therapy should not only aim at alleviating symptoms but also within removing toxins as well as enhancing a normal body balance.

Panchakarma is one of the therapies of Ayurveda which have been most critical in this purpose. It is a cleansing and purification which aids in clearing up of the toxins in the body. It also consists of such procedures as Vamana (vomiting therapy), Virechana (purges), and Basti (enema containing medicines) as well as care before and after the procedure. Such treatments are determined depending on the body type and the affliction state of the patient.

Panchakarma would be a considerable part in the framework of metabolic syndrome. It can aid in burning up body fat, digestion, body metabolism, and body overall functionality. On the case in point, treatment methods such as Udvartana (herbal powder massage) may be applied in maintaining obesity, whereas Virechana may be applied to enhance liver functions and lipid metabolism. Basti treatment aids hormonal and metabolic supplement.

Nowadays, there has been a resurgence in the methods of researching the effects of Panchakarma by scientists. There are research works that have indicated good outcomes in terms of weight reduction, blood sugar and balance lipids. Nevertheless, to define its efficiency, there is a need to conduct more clinical studies in a more systematic and well-designed manner.

The given research is thus undertaken in order to determine the treatment effect of the Panchakarma procedures in the treatment of metabolic syndrome. The study will also attempt to integrate the traditional Ayurvedic application with the new clinical assessment to come up

with a superior insight into the importance of these practices and how they can be integrated in contemporary healthcare procedures.

Literature Review:

Over recent years, there has been an augmented fascination in understanding the traditional medicine systems like Ayurveda in the treatment of chronic disorders and lifestyle disorders. Various researchers have carried out research in various areas of Ayurveda such as its theoretical background, clinical implications and its usability in contemporary medical practice. The following review gives significant contributions made by different scholars in this area.

The article by Hankey (2001) tabulates the increased significance of Ayurveda in treating chronic diseases. The paper emphasized the fact that modern medicine is usually on curing the symptoms, but Ayurveda is concerned with ensuring that there has been balance within the body, and preventing the disease at early stage. The author guides towards a mainstream healthcare system (Ayurveda) owing to its holism and personalized theory. It is particularly applicable to the chronic disorders like the metabolism due to the focus on diet, lifestyle and detoxification therapies.

Bhushan, Kalpana, and Arvind (2005) discussed the Ayurveda concept Prakriti and tried to build the scientific justification of it based on the genetic studies. Studying HLA polymorphism made them realize that various constitutional types as explained in Ayurveda could be based on biology. This paper is significant in that it endorses the premise that people react valiantly to illnesses and remedies and this is one of the Ayurvedic principles. These findings reinforce the use of individualized treatments such as the Panchakarma.

Sharma et al, (2007) were interested in the role of Ayurveda in health care system especially in prevention and promotion of health. Their research focused on highlighting that Ayurvedic lifestyle practices such as food control, lifestyle change, and the cleaning procedures are effective in decreasing chances of various chronic diseases. They further proposed the potential of improving the general health care outcome by the simple incorporation of Ayurveda with modern medicine particularly in the management of chronic illnesses.

Conboy, Edshteyn, and Garivaltis (2009) used a clinical study to estimate the impacts of Panchakarma as a holistic intervention. The findings included a nearing of physical and mental health significantly among the participants. The research was able to conclude that Panchakarma therapies do not merely aid in the process of detoxifying, but also supplement overall well-being. The study offers clinical justification to the application of Panchakarma in the treatment of lifestyle diseases.

In a type 2 diabetes epidemiological study undertaken by Mohan et al. (2007) in India, they found that the prevalence of the condition was rising at a rapid rate. The factors that were found to have significant contribution in the study include urbanization, sedentary lifestyle, and unhealthy diet. This underscores the necessity to implement competent management measures comprising preventive management to check the metabolic disorders.

The article of Misra and Khurana (2008) touched upon the issue of the increased rates of presence of obesity and metabolic syndrome in developing nations as well. They pointed out that lifestyle changes that have led to the consumption of more processed foods and less was another major factor that has led to such increase. Their research indicates that the treatment of such conditions needs a holistic approach that incorporates lifestyle modification, and that is in line with the Ayurvedic philosophy.

Mahalle et al. (2012) examined how Prakriti is related to cardiovascular risk factors. They found out that some of the types of constitutions are more likely to develop insulin resistance and other metabolic malfunctions. This is congruent with the Ayurvedic principle of the body type of a person being a major contributor in vulnerability to diseases and treatment of diseases.

Dey and Pahwa (2014) also examined the Prakriti and metabolism relationship. They discovered that the constitutions of the body are different and determine the metabolic rate and possibilities of being exposed to chronic diseases. This paper supports the significance of individualized form of treatment in Ayurveda especially in the management of metabolic syndrome.

The scientific study of Peterson et al. (2016) was based on using the metabolomic analysis to assess the impact of a Panchakarma-based intervention. These findings revealed that there were great variations in metabolic profiles after treatment which means to have better physiological functionalities. This research offers good scientific facts that prove the detox and metabolic advantages of Panchakarma.

The article by Tiwari, Gupta, and Srivastava (2018) was dedicated to the value of Panchakarma to prevent lifestyle conditions. They have determined that routine detoxification treatment finds use in ensuring internal balance and avoiding occurrence of chronic illnesses. Their results point to preventive and therapeutic value of Panchakarma.

In one of the articles, Jayasundar (2017) explained the Ayurvedic concept of Tridosha and its applicability to the field of modern science. According to the study, such conventional ideas can be linked with the physiological and biochemical activities in the body. This brings new opportunities in the integration of Ayurvedic knowledge with the contemporary science.

The heart rate variability adopted as an objective way of measuring Ayurvedic concepts allowed Manohar et al. (2018) to evaluate the dosha imbalance. The given study is important because it can contribute to closing the divide between the classical theories and contemporary methods of diagnosis.

Kumari, Laxmikant, and Khanal (2021) tested how effective Ayurvedic treatment combined is when treating diabetes mellitus type 2. Their research revealed an immense amelioration both in the blood sugar level and the general health condition and this proved that Ayurvedic treatment in metabolic disease management is effectively practical.

Objectives of the Study:

1. To evaluate the therapeutic effectiveness of Panchakarma procedures in the management of Metabolic Syndrome.
2. To assess the changes in key clinical parameters such as body mass index (BMI), blood glucose levels, lipid profile and blood pressure before and after treatment.
3. To analyze the overall impact of Panchakarma therapy on metabolic balance and quality of life in patients with Metabolic Syndrome.

Research Methodology:

The research was conducted in order to know the impact of Panchakarma therapies in management of Metabolic Syndrome. The changes in the patients were observed using a clinical and systematic approach to measure the changes that occurred in patients before and after the treatment.

The research was carried out in the form of prospective interventional research and carried out within a particular time frame. The outpatient and inpatient departments have been used to select a total of 50 patients diagnosed with Metabolic Syndrome. The study included only patients that passed the necessary requirements and were eager to be included in the research.

Individuals in the age bracket of 30 to 60 years and displaying the typical characteristics of Metabolic Syndrome like obesity, elevated blood sugar, high blood pressure and unnatural lipid profiles were taken. The study was however not done in patients with severe illnesses, pregnant females and individuals undergoing other significant treatments in order to maintain the preciseness of the study.

Panchakarma therapy was done on all the patients selected based on their body constitution (Prakriti) and the intensity of the ailment. Three steps were administered during the treatment. Preparatory ceremony such as Snehana (oleation) and Swedana (sudation) were also administered to take care of the body. This was then accompanied by the primary therapies which included Vamana, Virechana and Basti. Once the primary procedures were done, post treatment therapy in terms of the correct diet and lifestyle etching was given. Udvartana (herbal powder massage) was also used in the management of obesity in the patient.

To assess the outcome of the treatment, the vital clinical parameters were documented at the start and end of treatment. These were body mass index (BMI), the size of the waist, fasting blood sugar, lipid profiles, and blood pressure. These values were changed assisting in the realization of the effectiveness of the treatment.

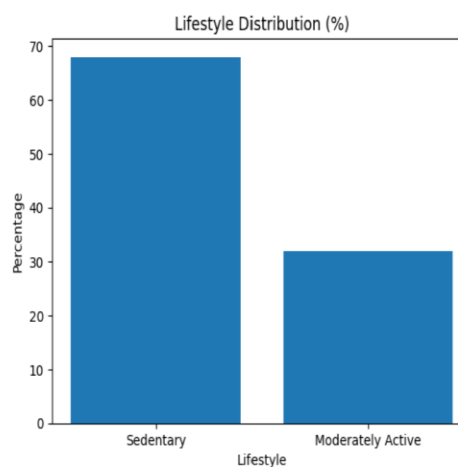
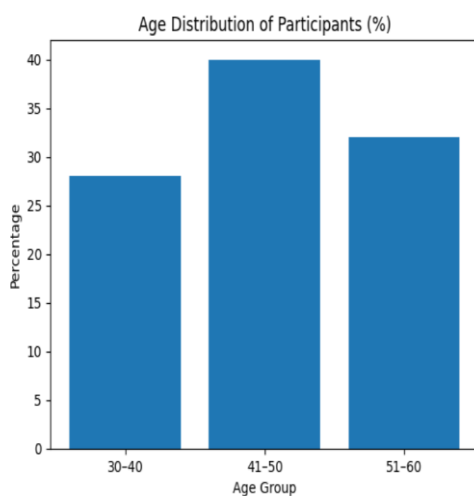
The data obtained were plotted and resolved with the simple statistical techniques. The paired t-test was used to determine the value before and after the treatment and the outcomes were taken to be significant when the p-value was below 0.05.

Ethical care had been exercised in the study in an appropriate manner. The procedure was explained to all the patients and their consent was obtained prior to initiating the treatment. The information of the patients was also kept confidential.

Data Presentation and Analysis

Table 1: Demographic Characteristics of Participants (n = 50)

Variable	Category	Number of Patients	Percentage (%)
Age Group	30□40 years	14	28%
	41□50 years	20	40%
	51□60 years	16	32%
Gender	Male	28	56%
	Female	22	44%
Lifestyle	Sedentary	34	68%
	Moderately Active	16	32%

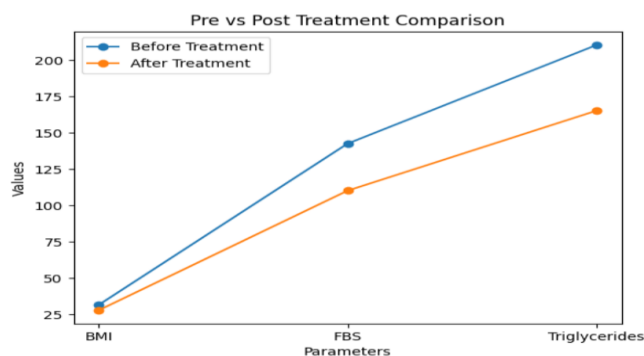


Analysis

Most of the interviewees were in the 41-50 age bracket (40%), which established that metabolic syndrome was more common among middle-aged people. Some of the factors that were strongly linked to the condition include a sedentary lifestyle (68%), which facilitates the influence of lifestyle factors causing diseases.

Table 2: Pre- and Post-Treatment Comparison of Clinical Parameters

Parameter	Before Treatment (Mean ± SD)	After Treatment (Mean ± SD)	% Improvement	p-value
BMI (kg/m ²)	31.5 ± 3.2	27.8 ± 2.9	11.7%	<0.05
Waist Circumference (cm)	102.4 ± 8.5	94.6 ± 7.9	7.6%	<0.05
Fasting Blood Sugar (mg/dL)	142.6 ± 18.4	110.2 ± 15.3	22.7%	<0.01
Triglycerides (mg/dL)	210.5 ± 25.6	165.3 ± 20.4	21.5%	<0.01
HDL (mg/dL)	38.2 ± 5.1	45.6 ± 4.8	↑19.3%	<0.05
Systolic BP (mmHg)	148.2 ± 12.3	132.4 ± 10.5	10.6%	<0.05
Diastolic BP (mmHg)	94.6 ± 6.8	84.2 ± 5.9	11.0%	<0.05

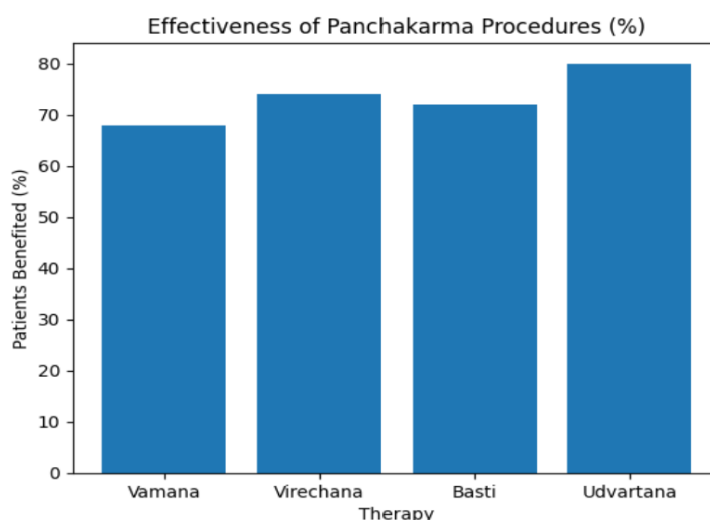


Analysis

- All significant clinical parameters have shown statistically significant changes in improvement ($p < 0.05$) after Panchakarma therapy. Notably:
- There was a very significant improvement in fasting blood sugar ($p < 0.01$) and triglycerides, which implies a high level of correction of metabolism.
- The level of HDL improved indicating better lipid metabolism.
- BMI and waist circumference decrease is, therefore, an indicator of the effectiveness in managing obesity.

Table 3: Effect of Individual Panchakarma Procedures

Therapy	Primary Effect Observed	Percentage of Patients Benefited
Vamana	Reduction in Kapha, weight loss	68%
Virechana	Improved lipid profile, detoxification	74%
Basti	Regulation of metabolism, insulin action	72%
Udvardhana	Fat reduction, improved circulation	80%

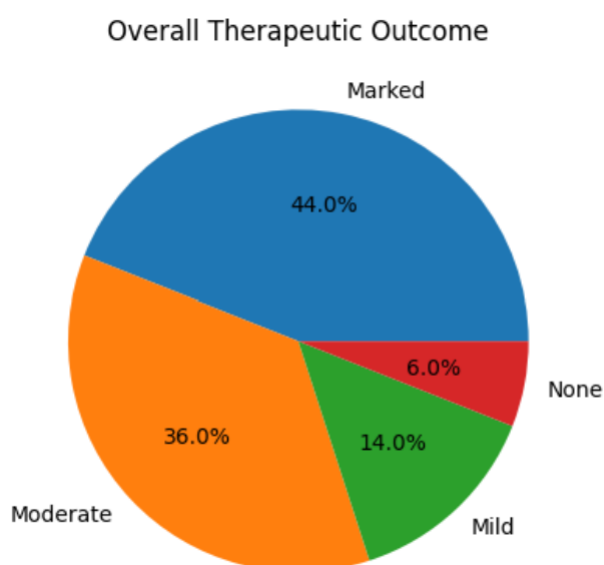


Analysis

Udvardana presented cost-effective results (80%) in diminishing the parameters of obesity. Virechana and Basti also played an important role in metabolism control, detoxification, and this factor made them the key to metabolic syndrome regulation.

Table 4: Overall Therapeutic Outcome

Outcome Category	Number of Patients	Percentage (%)
Marked Improvement	22	44%
Moderate Improvement	18	36%
Mild Improvement	7	14%
No Improvement	3	6%



Analysis

There was marked to moderate improvement in most of the patients (80%), which shows high clinical efficacy of Panchakarma therapies. A very low percentage (6%) did not respond and this could be explained by the individual variability or lack of the habit of following the diet and lifestyle guidelines.

Overall Statistical Interpretation

The paired t-test showed the observed changes in clinical parameters were statistically significant ($p < 0.05$), which proved that the intervention of Panchakarma has some significant and positive therapeutic outcomes on Metabolic Syndrome.

It has been stated in the study that:

- Panchakarma does not just suppress the symptoms, but also corrects the underlying metabolic disorder.
- It gives a comprehensive enhancement of the physiological and biochemical parameters.

- It is effective in being incorporated as a complementary therapy to treat lifestyle disorder.

Conclusion:

The current research paper has pointed out the high treatment potential of Panchakarma in the treatment of Metabolic Syndrome. The results of the research are very indicative that a systematic use of Ayurvedic detoxification therapies will culminate into significant changes in most of the crucial clinical parameters including body mass index, blood glucose levels, lipid profile and blood pressure. These are not just symptomatic but they show a wider rectification of the metabolic dysfunction.

Through remedying the dose of accumulated toxins (Ama) and re-establishing the equilibrium of Doshas and specifically, Kapha and Vata, Panchakarma therapies promote better digestive fire (Agni) and to a greater extent, metabolic efficiency. The Ayurveda method of maintaining an overall approach to health incorporates cleansing, dietary and lifestyle control, which is important towards the attainment of long-term health results.

The statistical analysis also supports the fact that the met changes are significant proving the effectiveness of Panchakarma as a complementary and integrative therapy effective measure. Most patients displayed medium to significant achieving improvement which indicated the clinical and practical application of these therapies in the management of lifestyle disorders.

Summing up, Panchakarma is a safe, natural and effective approach of finding the origin of Metabolic Syndrome, which results in lowering the likelihood of shaping the long-term complication factors and enhances the quality of life in general.

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