

Study Protocol

Evaluation of Vamana and Virechana Karma in the Treatment of Hypothyroidism – A Study Protocol

Abstract-

Background: Hypothyroidism can be understood and assessed on the basis of *Agni, Doshas, Dushyas, Sthanas* and *Srotasas*. In Ayurveda *Vamana* and *Virechana Karma* is considering as best line of purification procedures for the removal of toxin materials from the human body. Hypothyroidism occurs because of hypo functioning of thyroid gland which is located in neck region and even most of the signs and symptoms prove the involvement of *Kapha Sthana* and *Kapha Dosha*. So, in the present clinical research, *Vamana* and *Virechana karma* of Panchkarma will be selected as clinical tool to check its impact on Hypothyroidism (*Galaganda*). **Aim and Objectives:** To explore *Vamana & Virechana Karma* regarding their Clinical Importance. To validate *Vamana & Virechana Karma* as an effective mode of treatment in the management of Hypothyroidism. **Methodology:** 90 (45 in each group) patients will be selected by randomized reference standard controlled single blind double arm clinical trial, and third party will assign and enlist the patient. In Group A (Control) – Standard/ Control Group treated with Thyroxin and Group B (Experimental) – Intervention Group treated with *Vamana* and *Virechana Karma*. The evaluation will be recorded on 0, 30, 60, 90, 120, 150, 180 days. **Results:** Changes will be observed in objective outcomes. **Conclusion:** *Vamana* and *Virechana* will be effective in Hypothyroidism. **Key Words:** *Vamana, Virechana, Thyroid Profile, Hypothyroidism*

Comment [a1]: Shodana instead of Purification?

Comment [a2]: Most of the symptoms are Kapha and Medodushti why again galaganda?

Introduction:

Thyroid related disorders is one of the commonest disorders of Endocrine. As per the report by World Health Assembly, in more than 110 countries about 1.5 billion persons are vulnerable to thyroid disorders. 'World Health Organization (WHO) appraise that about 200 million people are suffering from goiter, although most of the goiters are small and subclinical' [1, 2]. Thyroid hormones (TH) are vital for growth and development and have an important role in energy homeostasis by maintaining the proper metabolism in body. The decrease or increase in the production of thyroid hormones resulted in various conditions which are characterized as hyper function (hyperthyroidism), hypo function (hypothyroidism), or inflammation (thyroiditis) of thyroid glands which can be benign or cancerous. Hypothyroidism is one of the disorders of the endocrine system in which the needed thyroid hormone is not being produced by thyroid gland. Due to which number of symptoms occur, such as deprived ability to tolerate cold, tiredness, constipation, depression, and weight gain. In pregnancy if hypothyroidism remains untreated it may lead to delays in growth and intellectual development in the baby or cretinism. It is also observed that hypothyroidism is more prevalent in older woman than man.

Comment [a3]: Endocrine system/Gland

Subclinical hypothyroidism (SCH) defined as a condition which is asymptomatic or presenting few to various full blown symptoms of overt hypothyroidism. Subclinical thyroid dysfunction is demarcated as an abnormal serum TSH level (reference range: 0.30 to 6.50 μ IU/L) and FT4 and FT3 levels within their reference range. The prevalence of SCH in general population is 3% to 8% in United States of America. Prevalence of SCH is relatively high among elderly women. In an elderly population, Iodine treatment and medication play a vital role in the progression of subclinical thyroid disorder compared to other causes of thyroid dysfunction.

In Ayurveda no any description of any disease condition similar to Hypothyroidism is found yet, several scattered references may be seen in various texts. On the basis of various hormonal disorders, *Nindita Purushas* [3] and *Avaranas* [4] can be described. Looking at the pathogenesis of hypothyroidism, this disorder can be said to be caused due to hypo functioning of the Agni as per the principles of Ayurveda.

Treatment of hypothyroidism with the allopathic medicines brings the value of Thyroid Stimulating Hormone (TSH) and thyroxin (T4) to normal range but continuous medication make the patient drug dependent until death. So, a better, safer and long lasting therapy is needed for the patients such type of ailment can be done through the heritage of Ayurveda. Hence, long term cohort study is required to claim that *Vamana & Virechana karma* is efficacious and helpful in the discontinuation of modern medicine.

The population prevalence is about 10%, mounting to 18%–22% in the elderly, of hypothyroidism [5, 6]. 5.0% of individuals (out of 2779 persons) older than 18 years were reported of hypothyroidism, defined as having a TSH > 6 mU/L, in the classic Whickham study conducted in the United Kingdom in 1977 [7]. The hypothyroidism diagnosis is mainly based on a TSH value, which has been refined over the last 25 years, getting ever greater sensitivity and reliability in measuring very low as well as high levels of TSH levels [8].

Notably, TSH measurement represents the most powerful interpreter for the outcome of spontaneous hypothyroidism in patients over 55 years, as these subjects reveal a low incidence of overt hypothyroidism (OH), who present with low serum TSH [9].

‘The prevalence of SCH in India, as gathered from various clinical and epidemiological studies ranges from 6 to 15%.’ [10].

A study in 2016 regarding assessment of ‘prevalence of hypothyroidism in pregnancy with TSH, conducted in nine states of India, found 13.13% of pregnant women to be hypothyroid. As per the guidelines of FOGSI, ITS & NRHM – Trimester-specific Thyroid Stimulating Hormone (TSH) cut offs of 2.5 mIU/L for the first trimester and 3.0 mIU/L for the second and third trimester, prevalence was found to be 44.3 per cent, 32.0 per cent, and 34 per cent in the first, second, and third trimester respectively’. There is considerable regional disparity in prevalence. It is more common in females than males (2-8 times higher) with reports of prevalence [11].

‘There is most prevalence of SCH compared to subclinical hyperthyroidism because in general population prevalence for SCH is 4% to 10% while for subclinical hyperthyroidism it is about 2% of general population’. The severity of the disease develops with the age and common in an elderly population. It is more mutual than anyone would believe and millions of people are presently hypothyroid & do not recognize it. In owed course of time, untreated hypothyroidism may lead to number of health glitches such as obesity, arthritis, heart disease, infertility etc.

Ayurveda has from time to time described the common thyroid-connected problem known as the simple goiter (*Galaganda*) [11], a state of hypothyroidism. The non-production of appropriate thyroid hormones leads to hypothyroidism. Ayurveda (*Galaganda*) is the most common hypothyroid form of the enlarged thyroid gland. [12], can now be correlated with goiter. According to Ayurvedic literature, impairment of *vayu*, *kapha*, and *meda* leads to the enlargement of the thyroid gland [13].

According to modern science, metabolic action of the body is controlled by thyroid hormones and as per Ayurveda, metabolic procedures of the body are under the control of *Agni*. The reason of hypothyroidism is modification in metabolic activity which, agreeing to Ayurveda, relates to vitiation of *Dhatvagni* and leading to *dhatwagni mandya*. The regular and irregular roles of *Agni* and Thyroid gland are alike. Even the signs of *Agnimandya* and Hypothyroidism are nearly same.

Comment [a4]: Mentioned under the Kapha & Medodushti for Hypothyroidism

Hyperthyroidism is the byproduct of thyroid hormone production and is often referred to as thyrotoxicity in the peripheral tissues. Which include genetic susceptibility, a major hyperthyroidism factors seem to be the immunologic increase in IgG antibodies or thyroid stimulants [14]. Enhancing thyroid hormone secretion, this result in increased metabolism and waste of energy. Reportedly, hyperthyroidism – thyrotoxic, exophthalmic goiter or Graves, thyroid carcinoma, adenoma, etc are the following diseases: thyroidism.

Two related hormones Thyroxine (T4) and Triiodothyronine secrete thyroid gland (T3). These hormones play a vital role during development in cell differentiation and help maintain thermogenic and metabolic homeostasis in the body. Hypothyroidism is termed deficiency of these hormones and the Basal Metabolic rate of the body lowers [BMR]. Subclinical hypothyroidism or mild thyroid failure is a most common endocrine disorder, affecting quality of life or health concern, with ‘the prevalence of 3 to 8% in the general population of without known thyroid disorders, worldwide. The prevalence varies with age, gender and geographic location’.

SCH is documented to be associated with various co morbidities like elevated LDL cholesterol and triglyceride levels, increased prevalence of coronary heart disease and related mortality, increased residual myocardial ischemia, increased peripheral neuropathies, muscular weakness, and reduced exercise capacity [15-18]. SCH is also found to be common in certain neuropsychiatric disorders like bipolar mood disorders, impaired cognitive functions in young.[19] Moreover, it has been found that treatment of SCH reduces the bad cholesterol levels and attenuates the likelihood of atherosclerosis[20].

Objectives:

- To explore *Vamana & Virechana Karma* regarding their Clinical Importance.
- To validate *Vamana & Virechana Karma* as an effective mode of treatment in the management of Hypothyroidism.

Research Question:

- In patients with Subclinical/ Primary Hypothyroidism, does *Vamana* and *Virechana Karma* decrease TSH level?

Hypothesis:

Research Hypothesis:

- *Vamana* and *Virechana Karma* are effective in decreasing the TSH level.
- *Vamana* and *Virechana Karma* is effective tool to improve the general wellbeing of patient with subclinical / Primary Hypothyroidism.

Null Hypothesis:

- *Vamana* and *Virechana Karma* have no role in decreasing the TSH level.
- *Vamana* and *Virechana Karma* have role in improving the general wellbeing of patients with subclinical/Primary hypothyroidism.

Materials and Methods:

Trial Design: Randomized Reference Standard Controlled Single Blind Double Arm Clinical Trial

Study Design: Patients attending OPD & IPD of Department of Panchakarma, Mahatma Gandhi Ayurved College & Research Center, Wardha and Shri Krishna Govt. Ayurvedic College, Kurukshetra will be selected for the study.

Grouping & Interventions:

- Two groups, parallel line
 - Group A:- Standard/ Control Group treated with Thyroxin.
 - Group B:- Intervention Group treated with *Vamana* and *Virechana Karma*.

Composition of Trial Drugs: All herbs will be purchased from an authentic pharmacy. Composition of trial drug is as follows –

Table 1. Composition of Trial Drugs

S.No.	Sanskrit Name	Boanical Name	Parts Used	Quantity
For Snehana				
1.	<i>Go Ghrita</i>	Cow's Ghee	Whole	As per Patient Need
For Vamana				
1.	<i>Madana Phala</i>	<i>Randia dumetorum</i>	Fruit	5 Part
2.	<i>Saindhava Lavana</i>	Rock Salt	Whole	1 Part
3.	<i>Madhu</i>	Honey	Whole	10 Part
For Virechana				
1.	<i>Draksha Churna</i>	<i>Vitis vinifera</i>	Fruit	2 Part
2.	<i>Aragwadha Churna</i>	<i>Cassia fistula</i>	Fruit	2 Part
3.	<i>Haritiki Churna</i>	<i>Terminalia chebula</i>	Fruit	2 Part
4.	<i>Kutaki Churna</i>	<i>Picrorhiza kurroa</i>	Fruit	1 Part
5.	<i>Erund Tailam</i>	<i>Ricinus communis</i>	Whole	4 Part

Inclusion Criteria:

Patients between the age of 20 to 50yrs, who are ready to give informed consent, having T3 Level < 100 ng/dL, T4 Level < 0.8 ng/dL, TSH > 4 mU/L, and are *yogya* for *Vamana* and *Virechana Karma*.

Exclusion Criteria:

Patients *ayogya* for *Vamana* and *Virechana*, Pregnancy or lactation, Congenital / diffuse Goitre (ICD-10 = E03.3), Chronic obstructive lung disease - already diagnosed, Iodine deficiency Goiter (ICD-10 = E00-02), Thyrotoxicosis (ICD-10 = E05) and of Thyroiditis (ICD-10 = E06).

Interventions:

Table 2. Total duration of intervention will be same for both the groups as follows –

	Group A	Group B
Sample size	45	45
Intervention	Tab. Thyroxin	Vamana & Virechana Karma
Duration of treatment	30 days	30 days*
Follow up period	180 days (Day – 30, 60, 90, 120, 150, 180)	180 days (Day – 30, 60, 90, 120, 150, 180)
Approximate Total duration	180 days	180 days

Table 3. Schedule of Duration of Treatment

Days	Group B
1.	Snehapana (Go-Ghrita 30 ml morning at 07:00 am empty stomach)
2.	Snehapana
3.	(Go-Ghrita increasing the dose by 30-50ml in Arohankramam (acc.to kosta, agni,
4.	and rogibala)
5.	daily morning at 07:00 am empty stomach)
6.	Till 7 th day
7.	Abhyanga (with Til Tailam) & Nadi Sweda
8.	Abhyanga (with Til Tailam) & Nadi Sweda
9.	Abhyanga (with Til Tailam) & Nadi Sweda Vamana Karma In Morning (Madan-Phal Pippali Churna – 5 gm + Saindhava Lavana – 1 gm + Honey – 10 gm) Samsarjana Krama (Evening – Peya)
10.	Samsarjana Krama (Morning – Peya Evening – Peya)
11.	Samsarjana Krama (Morning – Vilepi Evening – Vilepi)
12.	Samsarjana Krama (Morning – Vilepi Evening – Akrita Yusha)
13.	Samsarjana Krama (Morning – Akrita Yusha Evening – Akrita Yusha)
14.	Samsarjana Krama (Morning – Krita Yusha Evening – Krita Yusha)
15.	Samsarjana Krama (Morning – Krita Yusha Evening – Normal Diet)
16.	Rest Day
17.	Rest Day
18.	Snehapana (Go-Ghrita morning at 07:00 am empty stomach) equal to 1/3 rd of Day 7 dose
19.	Snehapana (Go-Ghrita morning at 07:00 am empty stomach) equal to 2/3 rd of Day 7 dose
20.	Snehapana (Go-Ghrita morning at 07:00 am empty stomach) equal to Day 7 dose Abhyanga (with Til Tailam) & Nadi Sweda
21.	Abhyanga (with Til Tailam) & Nadi Sweda
22.	Abhyanga (with Til Tailam) & Nadi Sweda
23.	Abhyanga (with Til Tailam) & Nadi Sweda
24.	Abhyanga (with Til Tailam) & Nadi Sweda Virechana Karma

	(<i>Kwath</i> made from <i>Draksha Churna</i> 20 gm + <i>Aragwadha Churna</i> 20 gm + <i>Haritiki Churna</i> 20 gm + <i>Kutaki Churna</i> 10 gm in 500 ml of water reducing it to 60 ml with <i>Erand Tailam</i> 40 ml) Samsarjana Krama (Evening – <i>Peya</i>)
25.	Samsarjana Krama (Morning – <i>Peya</i> Evening – <i>Peya</i>)
26.	Samsarjana Krama (Morning – <i>Vilepi</i> Evening – <i>Vilepi</i>)
27.	Samsarjana Krama (Morning – <i>Vilepi</i> Evening – <i>Akrita Yusha</i>)
28.	Samsarjana Krama (Morning – <i>Akrita Yusha</i> Evening – <i>Akrita Yusha</i>)
29.	Samsarjana Krama (Morning – <i>Krita Yusha</i> Evening – <i>Krita Yusha</i>)
30.	Samsarjana Krama (Morning – <i>Krita Yusha</i> Evening – Normal Diet)

Criteria for discontinuing or modifying allocated interventions:

If any untoward incidence, features of drug sensitivity or any other disease or problem arises, the subject will be withdrawn from the study and will be offered free treatment till the problem subsides.

Follow up: On 30th, 60th, 90th, 120th, 150th and 180th day.

Primary Outcomes: To evaluate *Vamana & Virechana Karma* in correcting the values of Thyroid Profile.

Secondary Outcomes:

- To evaluate *Vamana & Virechana Karma* in lowering the requirement of Thyroxin.
- To correlate the biochemical changes with improvement in the general wellbeing of patients of Hypothyroidism.

Statistical Analysis:

The progressions from the pattern will be dissected by utilizing Paired and Unpaired ‘t’ Test for target standards.

Time duration till following up: The patient will be followed up during treatment 180 days

Follow up period–0, 30th, 60th, 90th, 120th, 150th and 180th day

Recruitment: 90 (45 in each group) patients will be selected by randomized reference standard controlled single blind double arm clinical trial, and third party will assign and enlist the patient.

Methods: Data collection, management, and analysis

Data collection methods: Assessment criteria

Objective Parameters

Prakruti Pariksha (Analysis), Height and Weight (Body Mass Index) and Serum concentration of T3, T4 and TSH. All parameters will be assessed before and after the

treatment except *Prakruti Pariksha* (Analysis). *Prakruti Pariksha* (Analysis) will be done only before the start of the treatment.

Data management: the information passage coding will be finished by the third party.

Ethics and dissemination: Research ethics approval; approval from the research ethics committee has taken. No- Ref. No. MGACHRC/IEC/Aug-2020/99

Consent or assent: The made consent will be taken from the patient before starting the assessment. During the investigation, the classification of every patient will be kept up.

Dissemination policy: The information will be dispersed by paper distribution. Creation qualification rules and any proposed utilization of expert scholars.

Informed consent materials: With all the data model assent structure and other related documentation will be given to members.

Discussion:

Hypothyroidism can be understood and assessed on the basis of *Agni, Dosha, Dushya, Sthana* and *Srotas*. In Ayurveda *Vamana* and *Virechana Karma* is considering as best line of purification procedures for the removal of **toxin** materials from the human body. Hypothyroidism occurs due to hypo functioning of thyroid gland which is located in neck region and even most of the signs and symptoms prove the involvement of *Kapha Sthana* and *Kapha Dosha*. So, in the present clinical research, *Vamana* and *Virechana karma* of Panchkarma will be selected as clinical tool to check its impact on Hypothyroidism (*Galaganda*).

Vamana and *Virechana karma* are traditional and deep-rooted Panchkarma procedures which induces wellness. *Vamana* and *Virechana Karma* mean induction of emesis and purgation which helps to remove toxins from the body especially through the intestine. Generally depending upon intensity of procedure this Karma are classified into three categories; *Mridu* (mild) *Madhya* (intermediate) and *Tikshna* (strong). As like other Karmas, these Karma also carried out in three steps; *Poorvakarma, Pradhanakarma* and *Pashchatakarma*. *Sneha Pana*, fomentation and oil massage are suggested before performing this Karma to liquefy *Dosha* and toxins. Seeing the *Kapha* and *Pitta dosha* prevalence, *sroto shodhaka, Agnivardhaka* and *dosha pratyanyika chikitsa* these are best measures for the treatment of hypothyroidism.

Here in this regard a study is proposed to study the hormonal disorders influences and body mass index on the body with reference to *Vamana* and *Virechana Karma* in Hypothyroidism. Presently available managements are not capable of bringing TSH to normal level as no particular type of treatment is available to make these thyroid glands to secrete hormones to normal level. In this study we plan to find out the association of hormonal disorders and hypothyroidism to offer a remedy through *Vamana* and *Virechana* procedures of Panchkarma.

In this thesis an attempt is made to review the related literature of hypothyroidism and hormonal disorders interrelationships and *Vamana* and *Virechana Karma* in detail.

The observed data of influence of *Prakriti* on hypothyroidism, precipitating role of hormonal disorders and relief in respect to subjective and objective parameters are studied. All the parameters are well studied under the limelight of statistics and fair conclusions are drawn. The major conclusions are to make the use of *Vamana* and *Virechana Karma* in controlling TSH and relieving various symptoms of Hypothyroidism. A number of related studies were reviewed. Kombe et. al. assessed effect of kanchanar guggul in sub-clinical hypothyroidism with respect to agnimandya[21]. Kolli et. al. reflected on correlation of thyroid disorders with abnormal uterine bleeding[22]. Acharya et. al. reported on Early Manifestation of Impending Thyroid Storm[23]. Other related studies by Talwar et. al. [24], Neema et. al. [25], and Dixit et. al. [26] were reviewed.

Comment [a5]: Toxin?

In this study the diagnosed cases of Hypothyroidism will be taken as mentioned in the inclusion criteria and effect of *Vamana* and *Virechana* will be assessed.

Strengths: In case these procedures work on Hypothyroidism then this will be a boon for the patients to get rid of daily medication and as secondary outcome these procedures will help the individuals in the regularization of other systems of the body.

Limitations: No such limitations are being seen in current scenario as these procedures are in use of even healthy individuals since centuries.

Conclusion:

These procedures are very effective not only in many disorders but also in healthy individuals. That is why these are selected to be conducted on the patients of Hypothyroidism. As not much study of their role in this disorder has been found hence with the expectation of high significant change this study is planned.

NOTE:

The study highlights the efficacy of "Ayurveda" which is an ancient tradition, used in some parts of India. This ancient concept should be carefully evaluated in the light of modern medical science and can be utilized partially if found suitable.

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UNDER PEER REVIEW