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Case Report

Ayurveda intervention in Primary Hypothyroidism: A case report

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ABSTRACT:

Background: Thyroid hormones help maintain homeostasis as they play major role in various functions of the body. Hypothyroidism is a state of underactive thyroid gland which is diagnosed thorough laboratory parameters. Serum TSH value above 10mIU/L with or without the appearance of symptoms is considered to be optimal for initiation of treatment. In *Ayurveda*, no parallel can be drawn to the condition directly, rather it can be analyzed though lens of *Dosha* (humors), *duhsya* (tissues), *srotas* (channels) and *agni* (digestive fire). The disease often shows impaired digestive fire and increased *Kapha*. The case is of a symptomatic female who was diagnosed with Hypothyroidism with serum TSH values of 20mIU/L and managed thorough *Ayurveda*. **Clinical findings:** This is a case report of a female patient, aged 29 years, who presented with symptoms like reduced appetite, hair fall, weight gain for 2 months, who was diagnosed as Primary Hypothyroidism with a Serum TSH of 20mIU/L, Zulewskis score of 6 and ThyPRO-39 composite score of 24.08. **Intervention**: The patient was administered *Vadavanala vati* and *Pratimarsha nasya* (nasal administration of medicine) with *Anu taila*. **Outcome:** The Serum TSH was normalized in 9 months of treatment along with reversal of symptoms and improvement in quality of life and with maintenance of the same for next 4 years. **Conclusion**: *Nasya* (nasal drug administration) seems to be effective in restoring the Serum TSH levels to normal and maintenance of the same thereafter and it also highlights the potential of *Ayurveda* as a standalone intervention in the management of Hypothyroidism.

KEYWORDS: *Anu taila*, *Ayurveda*, case report, Hypothyroidism, *Nasya*

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1. INTRODUCTION

Hypothyroidism refers to a medical condition resulting from the deficiency of Thyroid hormones or inappropriate hormone action at the target tissues. [1] The definition of Hypothyroidism is predominantly biochemical since there is large variation in clinical presentation and general absence of symptom specificity. Overt or clinical primary Hypothyroidism is defined as Thyroid Stimulating Hormone (TSH) above the reference range and free Thyroxine levels below the reference range. [2] The prevalence of Hypothyroidism across globe is 5% and that of in India is 10.95%. [3]

Most common symptoms in adults are, weight gain, lethargy, dry skin, constipation, cold intolerance, fatigue, change in voice etc. Patients also show decline in mood and quality of life. The symptoms for diagnosis of Hypothyroidism are nonspecific. [2]

Levothyroxine monotherapy has been the mainstay treatment since its discovery in 1970s, following which no major breakthroughs are witnessed. Quality of life of patients on Levothyroxine improves but it does not always normalize in all. [4]

In *Ayurveda*, Hypothyroidism can be understood in the light of *dosha* (Humors), *agni* (digestive fire) and *srotas* (channels). It shows imbalance of *Kapha*. The disease exhibits suboptimal metabolism at the level of digestive fire and *dhatvagni* (tissue metabolism) especially tissue metabolism of *Rasa*. Features of *Rasavaha sroto dushti* (derangement of metabolic pathways) and *Kaphavrita vata* (functions of *Vata* obstructed by *Kapha*) are often found in the patients suffering with Hypothyroidism. [5],[6]

This case report documents the objective improvement in Thyroid Function Test (Serum T3, T4, TSH) achieved exclusively through *Ayurveda* intervention. Very few published cases provide clear, reproducible biochemical evidence of thyroid function recovery using classical *Ayurveda* treatment, which makes this case report academically valuable and strengthens the integrative understanding of Hypothyroidism management.

2. CASE REPORT

Patient information: A 29-year-old female, a lecturer by profession, hailing from middle class socioeconomic status consulted to *Kayachikitsa* (General medicine) OPD of SDM College of Ayurveda & Hospital, Hassan on 10/11/2020 with complaints of reduced appetite & fullness of abdomen in the past 2 months, weight gain of approximately 3 kgs in 2 months, increased hair fall, dryness of skin with reduced sweating, hard stools with incomplete evacuation of bowels since a month. On further enquiry patient also revealed irritability, malaise and lethargy.

The patient did not have any known ailments, had not been treated for the present complaints previously and the patient had no known family history of thyroid disorders.

Clinical findings:

According to *Ayurveda*: *Prakriti* (physical constitution) of the patient was *Pitta- Vatala*. The *Ahara shakti* (digestive capacity) and *Vyayama shakti* (physical endurance) was found to be *avara* (suboptimal).

The patient was afebrile with a pulse rate of 71 bpm and blood pressure of 110/80 mm Hg. General examination revealed absence of pallor, icterus and edema. The weight of the patient was 61.04kgs and height was 162cms. The BMI was calculated as 23.2 kg/m2.

Local examination of thyroid gland was conducted, which revealed no swellings, no tenderness and no locally raised temperature.

Zulewski's clinical score was adopted, whose score was 6 on calculation, which suggested Overt Hypothyroidism. ThyPRO - 39 questionnaire was administered to the patient. Score of ThyPRO – 39 was 24.08 which showed mild impact in quality of life due to thyroid disorder

Investigations:

Patient was advised to undergo CBC, Thyroid Function Test, Anti TPO test

The CBC was within normal limits

Anti TPO test – 23IU/mL (on 12/11/2020)

Table no 01: Thyroid Function Test on 12/11/2020 (Before treatment) -

	Values on testing	Normal range
Serum T3	0.30 ng/dL	80 – 220 ng/dl
Serum T4	1.04 mcg/dL	5.0- 12.0 ug/dl
Serum TSH	20mIU/L	0.5 – 5.0 mIU/L

Differential diagnosis:

Table no 02: Differential diagnosis

Disease	Inclusion factors	Exclusion factors
Hashimoto's thyroiditis	Symptoms like weight gain, reduced appetite, increased hair fall	Negative Anti -TPO test
Central hypothyroidism	Symptoms like weight gain, reduced appetite, increased hair fall	Elevated Serum TSH with reduced Serum T3 & T4
Primary Hypothyroidism	Symptoms and Thyroid Function test results	-

Diagnosis: Primary Hypothyroidism

Intervention: Compliance during and after administration of *Pratimarsha Nasya* (nasal route of drug administration): Patient was educated about the procedure of instillation of *Pratimarsha nasya* prior to the initiation of therapy. She was instructed to instill two drops of *Anu taila* in supine position with mild extension of neck. Proper positioning was emphasized to ensure adequate contact of drug with the nasal mucosa. After instillation she was advised to remain in the supine position for a few more minutes and to avoid immediate exposure to cold air, dust and wind as well as cold water. The patient was given a demonstration before initiating the treatment and was asked to demonstrate the procedure in the follow up visits to ensure correct technique. The adherence to post procedure instructions were confirmed with the bystander during regular follow ups.

Table no 03: Intervention

Date	Intervention	Dose	Anupana	Company name
12/11/2020 to 27/12/2020	*Vadavanala vati*	2 TID B/F	Warm water – Quantity sufficient	Prepared at SDM teaching pharmacy, Hassan
27/12/2020 to 26/09/2024	*Anu taila*	*Pratimarsha nasya* -2 drops twice daily, in the morning, after brushing and at night, before sleep	-	SDM pharmacy, Udupi

Assessment:

Table no 04: Scales adopted in the assessment of patient

	ThyPRO – 39 score [7]	Zulewski's score [8]
On 10/11/2020 (BT)	24.08	6
On 29/06/2021	0	0
On 26/09/2024	0	0

Results:

Thyroid Function Test was carried out at every 45 days until the Serum TSH normalized.

Table no 05: Thyroid Function Test during the course of treatment

Date	Serum T3	Serum T4	Serum TSH	Intervention
27/12/2020	0.40ng/dL	2.01 ug/dL	16.03 mIU/L	*Vadavanala vati*
13/02/2021	0.45 ng/ml	3.56	14.67	*Pratimarsha nasya* with *Anu taila*
28/03/2021	0.55 ng/ml	3.09	11.02	
14/05/2021	0.75	4.01	9.08	

	ng/ml			
29/06/2021	1.02 ng/ml	6.12	6.75	
14/08/2021	1.89 ng/ml	7.08	4.01	
26/09/2024	1.07 ng/dL	6.68	2.67	

Table no 06: Subsidence of symptoms during the treatment

Symptoms before treatment	**Subsidence of symptoms during treatment**
Fullness of abdomen	45 days
Diminished appetite	45 days
Hard stools with incomplete evacuation	45 days
Dryness of skin	2 months
Weight gain	3 months
Hair fall	6 months

Patient tolerated the treatment well and no adverse events were noted during the treatment period. The adherence to the treatment was ensured during regular follow ups by the account of bystander who accompanied the patient. No concurrent medicines used.

3. DISCUSSION:

Discussion on *Vadavanala vati*:

The functions of thyroid hormones can be co related with *agni* (digestive fire) as they primarily maintain metabolism in the body. Decline in thyroid hormones brings down the metabolism which mimics symptoms arising due to *agni mandya* (Diminished metabolism). *Vadavanala vati* [9] contains *Saindhava* (rock salt), *Pippali* (*Piper longum L*), *Pippali moola* (root of *Piper longum L*), *Chavya* (*Piper chaba* Hunter), *Chitraka* (*Plumbago zeylanica* L.), *Nagara* (*Zingiber officinale* Roscoe), *Haritaki* (*Terminalia chebula* Retz), which are *Deepana* (carminative), *pachana* (digestive) and *srotoshodhana* (clearing the obstructed channels) in nature. It helps increase the *agni* at *jatharagni* level and at the level of tissue metabolism of *Rasa*. By virtue of hot, penetrative properties it subsides vitiated *Kapha*. Hence *Vadavanala vati* was given for 45 days.

Discussion on *Pratimarsha nasya* with *Anu taila*:

The regulation of Thyroid hormones is by the Hypothalamo-Pituitary- Thyroid Axis. All the 3 components of the axis are present in the *Urdhwajatru pradesha* (Head & neck region), which is the primary place of *Kapha*. The obstruction to normal movement of *Vata* by *Kapha* is seen in Hypothyroidism. [5, 6] For diseases of head & neck and for *Kaphavrita vata*, *Nasya* (nasal drug instillation) is described as a treatment option.

Nasal cavity is considered as gateway to cranium. [10] The drug administered through *Nasya* reaches *sringataka marma* (a vital point in the cranium) [11] and helps expel the vitiated humors from the area; especially *Sneha pradhana navana* (lipophilic) *Nasya* gets absorbed better from the *Shringataka marma*. The location of *Shringataka marma* is *shiraso antarmadhya murdha*, which can be considered as middle cranial fossa. Sella turcica of middle cranial fossa houses pituitary gland, which is responsible for regulating the release of thyroid hormones from the thyroid gland.

Anu taila contains *Bilva* (*Aegle marmelos* L.), *Shyonaka* (*Oroxylum indicum* L.), *Patala* (*Stereospermum suaveolens* DC.), *Gambari* (*Gmelina arborea* Roxb.), *Agnimantha* (*Premna mucronate* L.), *Brihati* (*Solanum indicum* L.), *Kantakari* (*Solanum surattense* L), *Shalaparni* (*Desmodium gangeticum* (L) DC), *Prishnaparni* (*Uraria picta* (L) DC), *Gokshura* (*Tribulus terrestris* L.), *Yashtimadhu* (*Glycerrhiza glabra* L.), *Rasna* (*Pluchea lanceolata* (DC) C B Clarke), *tila taila* (sesame oil), *Sanidhava* (rock salt), *Aja dugdha* (Goat's milk). *Anu taila* contains hot, penetrating drugs which pacifies *Kapha* and *Vata* and does *shodhana* (cleansing) and *lekhana* (drying up) of *Kapha.*

Supporting evidence from similar case study, where Anu Taila was administered for 7 days over three consecutive months, along with concomitant oral medications showed

improvements in Serum TSH values and subjective clinical parameters. [12]

There are three pathways via which drug delivery occurs from nasal cavity to brain;

1. Olfactory pathway
2. Trigeminal pathway
3. Peripheral pathway. [13]

Olfactory pathway: The olfactory pathway involves drug delivery to the brain via the olfactory neurons situated in the olfactory region in the nasal mucosa. This pathway enables drugs to be delivered to the brain without going through the systemic circulation. [14] It happens through two routes; intracellular transport and extracellular transport. Intracellular pathway starts with internalization of molecule of the drug and transporting it through the neuron by endocytosis and releasing it in the brain, where it is distributed to different brain regions via exocytosis. [13] [15] This takes several hours to days to deliver the drug to the target site. The extracellular or the extra neuronal pathway involves the drug passing through the nasal epithelium to the lamina propria and through the gap between the olfactory neurons and subsequently being transported to olfactory bulb. [13] [15] Upon reaching the olfactory bulb, the molecule is distributed to other areas in brain by perivascular pumps. [13] [15] This mode of transportation by extracellular pathway only takes a few minutes to deliver the molecule of the drug to the olfactory bulb, that is to say, among the two modes of transportation that the drug takes within the olfactory pathway, extracellular mode is much quicker.

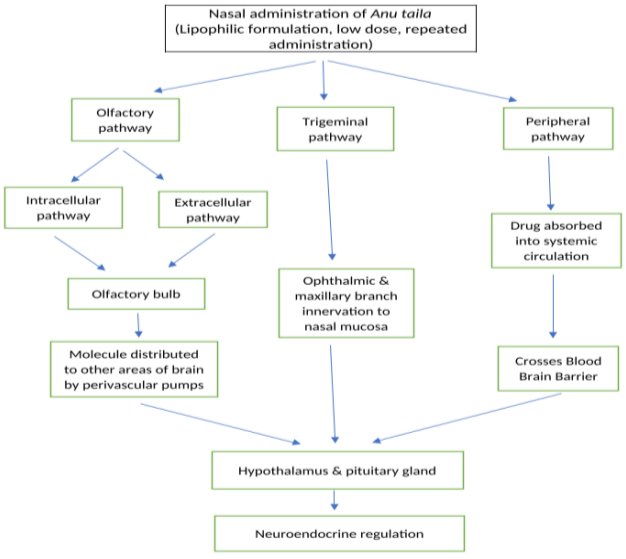
Trigeminal pathway: Ophthalmic branch and maxillary branch of trigeminal nerve have innervations in the nasal mucosa. [15] The drugs get delivered to the brain via these pathways.

Peripheral pathway: The administered drug also has vascular absorption. The portion absorbed into the systemic circulation gets delivered to the brain via Blood Brain Barrier (BBB). Peripheral delivery is faster in those drugs which contain low – molecular – weight lipophilic molecules. [13]

When drug is administered through *Nasya,* the physical distance the molecule has to travel to reach brain is short and the bioavailability of the drug is much higher at just 0.01 – 1% of oral dosage, [14] [15] as it avoids first pass metabolism. The supine position with head tilt which is assumed during administration of *Nasya* improves the chances for the drug to be delivered to the olfactory mucosa which in turn improves the absorption of drug leading to better bioavailability.

The nasal administration of drug has evidences of reaching hypothalamus, which helps regulates the Hypothalamo-pituitary – thyroid axis. [14]

The *Pratimarsha Nasya* is a relatively simple technique which does not require medical personnel to administer it and does not cause any pain or discomfort and hence the patient was able to follow it without difficulty which improved patient adherence to the treatment, which resulted in gradual subsidence of symptoms (Table no 06) evidenced both by normalized ThyPRO – 39 & Zulewski's score (Table no 04) and normalized Thyroid Function Tests (Serum TSH, T3 & T4) (Table no 05).



Flowchart 1: Mode of action of nasya

Limitations: As this is a single -patient case report, the findings of the study cannot be generalized. Without controlled clinical studies, casual inference about effectiveness and mode of action of the intervention cannot be drawn.

4. CONCLUSION:

This case study highlights the potential of *Ayurveda* as a standalone therapy in the management of Primary Hypothyroidism. The Serum TSH values decreased from 20 mIU/L to 4.01 mIU/L in the span of 9 months with subsidence of symptoms and improvement in quality of life of the patient. The Serum TSH values have been stable for 4 years with *Anu taila Pratimasha Nasya* with no adverse effects. The formulations employed are easily available and financially feasible.

Declaration of Patient Consent – The authors confirm that they have acquired a patient consent form, in which the patient or caregiver has granted permission for the publication of the case, including accompanying images and other clinical details, in the journal. The patient or caregiver acknowledges that their name and initials will not be disclosed, and sincere attempts will be undertaken to safeguard their identity. However, complete anonymity cannot be assured.

Patient perspective - The patient reported a gradual reversal of symptoms and improved quality of life. The treatment regimen was easy to adopt and helped with adherence.

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Declaration of Generative AI

The authors declare this manuscript was written without the use of generative artificial intelligence tools. All the content, including text generation, data analysis and references was developed and reviewed by the author without assistance from AI technologies.

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