

ORIGINAL RESEARCH ARTICLE

# Synergistic effect of *Jalakumbhi* (*Pistia stratiotes* L.) *Panchanga Bhasma* and *Pippali Churna* in a Case of Hypothyroidism

Author: Krishana Bihari<sup>1</sup>,

Co Authors: Ajai Kumar Pandey<sup>2</sup>, Meenu<sup>3</sup> and Rakesh Kumar<sup>4</sup>

<sup>1,2</sup> Department of Kayachikitsa, Institute of Medical Sciences, Banaras Hindu University, Varanasi, UP, India

<sup>3</sup> Ayurveda Medical Officer, CHC, Bhilwara, Rajasthan, India

<sup>4</sup> Department of Shalya Tantra, Jeevak Ayurvedic Medical College, Varanasi, UP, India

## ABSTRACT

Hypothyroidism is the most common endocrine disorder observed all over the world at the present time. The normal as well as abnormal functions of the thyroid gland can be correlated to the healthy and altered status of *Agni* (~bio-fire). The most effective hormone replacement therapy for hypothyroidism is levothyroxine, but its many side effects include hair loss, headaches, irregular menstruation, etc., pushing people to seek alternate therapies. In this case study, a hypothyroid case has been treated successfully with a combination of *Jalakumbhi* (*Pistia stratiotes* L.) *Panchanga* (~whole plant) *Antardhuma bhasma* (~herbo-ash) and *Pippali* (*Piper longum* L.) *churna* (~powder). After 3 months of treatment, the patient shows a significant response to the reduction of serum TSH (thyroid stimulating hormone) level reduced from 13.41 to 4.32 and a significant improvement in Zulewski's clinical score from 7 to 2 after the treatment. *Jalakumbhi* and *Pippali* were found to have thyroid-stimulating properties.

**Key Words** *Ayurveda, Galganda, Herbal drug, Hypothyroidism, Pistia stratiotes*

Received 12<sup>th</sup> January 23 Accepted 07<sup>th</sup> January 24 Published 10<sup>th</sup> January 2024

## INTRODUCTION

Hypothyroidism is a disorder characterized by varied symptoms and/or signs related to decreased metabolism due to decreased production/action of thyroid hormones and/or thyroid-stimulating hormone (TSH) excess<sup>1</sup>. Thyroid disease is one of the most prevalent health conditions in the world<sup>2</sup>. It occurs about 7-8 times more frequently in females than males<sup>3,4</sup>. the prevalence of self-reported goitre or thyroid

disorder in National Family Health Survey V [NFHS V (2019-2021)] was 2.9%<sup>5</sup>. The primary underlying pathophysiology of hypothyroidism is tissue hypometabolism<sup>6</sup>. In Ayurveda, *Mandagni* (~weak state of *agni*) is connected to this hypometabolism<sup>7</sup>. The vitiation of metabolic factors (such as bio-fire, *rasa* and *meda dhatus*, and hypofunctioning of *pitta dosha*) results in the formation of *Ama* (~state of incomplete transformation) at three levels i.e.; *Jatharagni*

## ORIGINAL RESEARCH ARTICLE

(~GI biofire) level, *Bhutagni* (~Cellular biofire) level, and *Dhatvagni* (~Tissue biofire) level. The clinical picture of hypothyroidism i.e., lethargy, fatigue, weakness, Heaviness in the body, sleepiness, hypochlorhydria, constipation, and loss of appetite has a close resemblance to the presence of a state of incomplete transformation in the body<sup>8</sup>. Hypothyroidism is a disorder that can be attributed to vitiation of metabolic factors<sup>9</sup>. Resulting from weak state of metabolic factors are *Kapha Vata Dosha Vraddhi* (~pramotion) and *Pitta Kshaya* (~diminution). This condition is affected by hypofunction of metabolic factors at dhatu level, particularly *Rasa* and *Medadhātu*<sup>10</sup>. The signs and symptoms of hypofunction of thyroid match with several conditions like *Vataja Shotha* (characterized by non-pitting edema-a feature of myxedema)<sup>11</sup> and *Rasapradoshaja Vikara* (~disorders of *rasa dhatu*)(characterized by loss of appetite, heaviness, fatigue)<sup>12</sup>. Looking at its chronicity and effect on various body systems, need for a careful search in there to find out an effective and safe remedy against hypothyroidism. Some herbal medications have been explored to control the disease as part of a therapeutic approach. In this instance, the aquatic herb *Jalakumbhi herbo-ash* is used as the primary medication for hypothyroidism coupled with *Pippali* powder, which have *yogavahi* (~synergic effect)<sup>13</sup> and biofire-promoting properties.

## PATIENT INFORMATION

A 28-year-old female, housewife, having a history of puffiness of face, loss of hair, weight gain, weakness, lethargy, irregular menstruation etc. since 6 months. The patient does not have any allergic history before the present illness. No previous history of Diabetes mellitus, hypertension was found. No complaints of other systemic illnesses like Rheumatoid Arthritis & Systemic Lupus Erythematosus. The patient is a moderately built woman with a good appetite. She is a vegetarian. Her sleep habit was normal. Bowel habits were constipated. On advice, she underwent for investigations of a thyroid profile, Hb%, lipid profile, and thyroid antibody test. After seeing the report, advise starting medication.

## CLINICAL FINDINGS

On examination, patient has periorbital puffiness (non-pitting edema), coarse and cold skin. The patient was afebrile. Pulse was 88/min. Her blood pressure was 128/92 mmHg. Pallor, Icterus, Cyanosis, and Clubbing were absent. No abnormality was noticed in the functioning of the respiratory and circulatory systems.

## Ashtavidha pariksha (~ eight-fold examination)

On examination, it was evident that the patient had *Nadi* (~pulse) *madhyama*, *vata-kaphaja* rate of 88/min. *Jivha* (~tongue) was *malavrata* (~coated). *Mala* (~excreta) was *savibandhapravrutti* (~constipation) with 1-2 times/day, *Mutra* (~urine) *pravrutti* (~frequency of micturition) was also normal with 5-6

## ORIGINAL RESEARCH ARTICLE

times/day. *Sparsha* (~touch) was *Ruksha* (~dry) and *sheeta* (~cold), No abnormality was noted in *Shabda* (~speech), and *Drik* (~vision).

### DIAGNOSTIC ASSESSMENT

The diagnosis of hypothyroidism was made using hematological parameters (shown in Table 4) including thyroid profile and Zulewski's clinical score (shown in Table 2)<sup>14</sup>. In this case the Zulewski's clinical score was 7. Ayurvedic assessment of the patient was done using *Ashtavidha pareeksha* (~eight-fold examination of the patient). In Ayurveda the disorders of thyroid gland are explained under the heading of *Galaganda*. By analyzing the symptomatology of hypothyroidism in the light of *Ayurvedic* literature, it is observed that hypothyroidism may be correlated with *Kaphaja galaganda* as it

occurs predominantly due to vitiation of *Kapha Dosh*, *Rasa Dhatu* and *Meda Dhatu*.

### THERAPEUTIC INTERVENTION

*Jalakumbhi Panchanga Antardhuma bhasma* was prepared and packed in capsules and dried *Pippali* (*Piper longum*) fruits were procured and finely powdered at the GMP (Good Manufacturing Practice) certified pharmacy.

Cap. *Jalakumbhi bhasma*- 500mg (1Cap) BD after meal with lukewarm water.

*Pippali* powder- 500mg BD after meal with honey.

### TIMELINE

In the present case, the treatment was continued for 90 days. The timeline of the treatment is shown in Table 1.

**Table 1** Timeline and therapeutic intervention

| Date   | Remarks/observations   | Treatment  |
|--|--|--|
| 8 <sup>th</sup> September 2022                           | After seeing the report, reach to diagnosis and advise starting treatment  | Counseling was done<br>Capsule Jalkumbhi bhasma 1 BD<br>Pippali powder 500mg BD with honey |
| 7 <sup>th</sup> Oct. 2022<br>(1 <sup>st</sup> Follow up) | Mild improvement in signs and symptoms, which was shown in Table-3, no fresh symptoms  | Capsule Jalkumbhi bhasma 1 BD<br>Pippali powder 500mg BD with honey                        |
| 7 <sup>th</sup> Nov. 2022<br>(2 <sup>nd</sup> Follow up) | Mild improvement in signs and symptoms, significant improvement in investigations, which was shown in Table-4, no fresh symptoms |  |
| 7 <sup>th</sup> Dec. 2022<br>(3 <sup>rd</sup> Follow up) | Improvement in mostly signs and symptoms, no fresh symptoms  | Advice to the patient for thyroid profile after every 3 months                             |

**Table 2** Zulewski's clinical score for hypothyroidism in case

| Evaluation            | Description   | Score |
|-----------------------|---|-------|
| <b>Sign</b>           |   |       |
| Slow of movements     | Observing patient while walking and sitting   |       |
| Ankle reflex          | Observing delayed relaxation of the ankle reflex                                    | 0     |
| Coarse skin           | Dermatologic examination of the hand, forearm and elbow for thickness and roughness | 1     |
| Periorbital puffiness | Observing periorbital swelling  | 1     |
| Cold skin             | Comparing the temperature of the hand with the examiner's                           | 1     |
| <b>Symptoms</b>       |   |       |
| Diminished sweating   | Sweating in normal or warm room   | 1     |
| Voice hoarseness      | Change in speaking or singing voice   | 0     |
| Paresthesia           | Subjective sensations   | 0     |
| Dry skin              | Dryness of the skin, requiring skin moisturizing products                           | 1     |
| Constipation          | Bowel habit and use of laxatives  | 1     |

**ORIGINAL RESEARCH ARTICLE**

|                           |                       |   |
|---------------------------|-----------------------|---|
| <b>Hearing impairment</b> | Difficulty in hearing | 0 |
| <b>Weight increase</b>    | Increase in weight    | 1 |

Note: A score of 6 and above is defined as hypothyroidism, while 0-2 points are considered euthyroid. A score of 3-5 is defined as intermediate

**FOLLOW UP AND OUTCOMES**

The treatment was started on 08/09/2022. The patient received a *Jalakumbhi panchanga antardhuma bhasma* capsule (500mg) twice daily and *pippli churna* 500mg twice daily with honey after meals for one month. The patient was followed up every month for three months to assess the improvement in signs and symptoms based on Zulewski's clinical score and to assess any adverse effect. During the management period, no other therapeutic intervention was enforced to patient. After every follow ups and assessment the degree of improvement was noted

in clinical features such as puffiness of face, body weight, constipation, dryness of skin, hair fall along with Zulewski's clinical score was reduced from 7/12 points to 2/12 after the completion of treatment (shown in Table 3). The objective parameters were assessed based on a thyroid function test which showed a reduction in TSH levels from 13.41µIU/mL to 4.32µIU/mL after treatment. The entire trial intervention was without any adverse effects noted and all basic investigations were found to be within the normal limits before and after the treatment (shown in Table 4).

**Table 3** Change in Zulewski's clinical score after each Follow Up

| Evaluation            | BT       | 1 <sup>st</sup> Follow up | 2 <sup>nd</sup> Follow up | 3 <sup>rd</sup> Follow up |
|-----------------------|----------|---------------------------|---------------------------|---------------------------|
| <b>Sign</b>           |          |                           |                           |                           |
| Slow of movements     | 0        | 0                         | 0                         | 0                         |
| Ankle reflex          | 0        | 0                         | 0                         | 0                         |
| Coarse skin           | 1        | 1                         | 1                         | 0                         |
| Periorbital puffiness | 1        | 0                         | 0                         | 0                         |
| Cold skin             | 1        | 1                         | 1                         | 1                         |
| <b>Symptoms</b>       |          |                           |                           |                           |
| Diminished sweating   | 1        | 1                         | 0                         | 0                         |
| Voice hoarseness      | 0        | 0                         | 0                         | 0                         |
| Paresthesia           | 0        | 0                         | 0                         | 0                         |
| Dry skin              | 1        | 1                         | 1                         | 1                         |
| Constipation          | 1        | 0                         | 0                         | 0                         |
| Hearing impairment    | 0        | 0                         | 0                         | 0                         |
| Weight increase       | 1        | 1                         | 1                         | 0                         |
| <b>Total Score</b>    | <b>7</b> | <b>5</b>                  | <b>4</b>                  | <b>2</b>                  |

**Table 4** Change in Investigations after each Follow Up

| Investigations                 | BT    | 1 <sup>st</sup> Follow up | 2 <sup>nd</sup> Follow up | 3 <sup>rd</sup> Follow up |
|--------------------------------|-------|---------------------------|---------------------------|---------------------------|
| <b>Thyroid Function Test</b>   |       |                           |                           |                           |
| • Serum TSH (µIU/mL)           | 13.41 | 10.53                     | 6.34                      | 4.32                      |
| • Serum T <sub>3</sub> (ng/dl) | 138   | 142                       | 122                       | 150                       |
| • Serum T <sub>4</sub> (µg/dl) | 10.65 | 10.54                     | 12.59                     | 9.34                      |
| <b>Lipid Profile</b>           |       |                           |                           |                           |
| • Cholesterol(mg/dl)           | 137   | 130                       | 125                       | 112                       |
| • Triglyceride(mg/dl)          | 241   | 232                       | 225                       | 201                       |

ORIGINAL RESEARCH ARTICLE

| Blood Hb% (gm/dl) | 10.7 | 11.0 | 11.2 | 11.3 |
|-------------------|------|------|------|------|
|-------------------|------|------|------|------|

**DISCUSSION**

These drugs in combination act as antagonists to the main morbid factors i.e., *Dosha* (~regulatory functional factors of the body) and *Dushya* (~major structural components of the body) to cause *Samprativighatana* (~breaking of pathogenesis) to all of the symptoms of the disease. According to the fundamentals of *Ayurveda*, for the cure of any disease, breaking pathogenesis is the basic line of treatment<sup>15</sup>.

Hypothyroidism has *kapha-vataja* clinical manifestations. Keeping in mind the pathogenesis of Hypothyroidism, we have selected *Jalakumbhi* which has *Tikta* (~bitter), *Madhura* (~sweet) *rasa* (~taste) & *Laghu* (~lightness), *Ruksha* (~dryness) *guna* (~attribute), and *tridoshashamaka* (three regulatory functional factors of the body) properties<sup>16</sup>. So, due to *Tikta rasa* and *Laghu, Ruksha guna Jalakumbhi* act as *Ama Pachana* and *shamana* of aggravated *kapha*, hence increasing the *Dhatwagni*, removing *Ama lakshanas* of the body. Its *bhasma* has *shothhara* properties which is one of the complaints in hypothyroidism<sup>17</sup>. *Pippali* was also efficacious in providing symptomatic relief in hypothyroidism especially with constipation, cold skin, and periorbital puffiness. *Pippali* have the properties of *katu rasa, laghu, tikshna & snigdha guna, Anushnashita veerya* and *Madhur vipaka*<sup>18</sup>. *Pippali churna* with honey have aggregate action is reflected as *meda-kaphashamak*<sup>18</sup>.

Reduction in Zulewski's clinical score from 7/12 points to 2/12 and reduction in TSH levels from

13.41μIU/mL to 4.32μIU/mL demonstrates the potential of capsule *Jalakumbhi bhasma* and *pippali churna* in Hypothyroidism. According to the assessment by the Zulewski's clinical score, it is evident that the patient has obtained significant relief in symptoms of slow of movements, ankle reflex, coarse skin, periorbital puffiness. Individual scores of these parameters showed significant reduction supporting the symptomatic relief achieved.

According to *Ayurveda*, a compromised metabolism is comparable to *Agni* vitiation. *Ama* is formed as a result of the digestive fire becoming dysfunctional. As a result of *Deepana* (appetizing), *pachana* (digestive potency) *gunas* (property) of the *pippali* improve *Agni* (bio-fire) and normalize body metabolism. It nourishes all seven *Dhatu*s because of its *Rasayana* (rejuvenation) *Guna*<sup>18</sup>. This could be understood that *Pippali* have direct impact on the symptoms of hypothyroidism. *Pippali* contains chemical constituents which have anti-hyperlipidemic<sup>13</sup>, anti-obesity, and bio-enhancing properties<sup>21</sup> which could have facilitated correcting the deranged metabolism (fat, carbohydrate, micronutrients, etc.) which is principally hampered in Hypothyroidism. The anti-oxidant, immuno-modulatory and anti-inflammatory<sup>19</sup> action of *Pippali* might have also helped in pacifying the autoimmune response and stimulating the function of the thyroid gland. The fruit part of *pippali* consists of volatile oil (1%), protein, starch, alkaloids, saponins, carbohydrates

## ORIGINAL RESEARCH ARTICLE

and amygdalin, a waxy alkaloid Nisobutyldeca-trans-2-trans-4-dienamide, alkaloids piperine, calcium, phosphorus, iron and a terpenoid substance<sup>20</sup>. The bio enhancing effects of piperine have been demonstrated in several other studies showing that piperine can improve the absorption of selenium<sup>21</sup>, which is a trace element that is particularly abundant in the thyroid gland, where it is integrated into a number of selenoproteins that play important roles in the gland<sup>22</sup>. It required for deiodinase reaction of the thyroid hormone necessary for bioactivity of the hormone<sup>23</sup>.

The patient has shown symptomatic relief and normal thyroid profile after three months of treatment with capsule *Jalakumbhi bhasma* and *Pippali* powder. Allopathic treatment was not taken during the management period. The patient was then followed up for the next three months and found free of symptoms till the last follow-up.

## CONCLUSION

From the above study, it can be concluded that capsule of *Jalakumbhi bhasma* and *Pippali* powder improve quality of life as an effective drug for managing symptoms of Hypothyroidism without any side effects. There was a significant reduction in the signs and symptoms of the disease, as well as in the thyroid profile. But this is a single case study hence to prove its efficacy there is a need to conduct a study on large number of patients.

## DECLARATION OF PATIENT CONSENT

Authors certify that they have obtained patient consent form, where the patient has given her consent for reporting the case along with the images and other clinical information in the journal. The patient understands that her name and initials will not be published and due efforts will be made to conceal her identity, but anonymity cannot be guaranteed.

## Financial support and sponsorship

Nil.

## Conflicts of interest

There are no conflicts of interest.

ORIGINAL RESEARCH ARTICLE

REFERENCES

1. Anil Bhansali and Yashpal Gogate, Clinical Rounds in Endocrinology, Ed. 2015, Vol. 1, Springer India; 2015, Page: 189
2. Rai S, Sirohi S, Khatri AK, Dixit S, Saroshe S. Assessment of knowledge and awareness regarding thyroid disorders among women of a cosmopolitan city of central India. Ntl J Community Med. 2016; 7(3):219–22.
3. Hollowell JG, Staehling NW, Flanders WD, Hannon WH, Gunter EW, Spencer CA, et al. Serum TSH, T (4), and thyroid antibodies in the United States population (1988 to 1994): National Health and Nutrition Examination Survey (NHANES III) *J Clin Endocrinol Metab.* 2002; 87: 489–99.
4. Bembien DA, Hamm RM, Morgan L, Winn P, Davis A, Barton E. Thyroid disease in the elderly. Part 2. Predictability of subclinical hypothyroidism. *J Fam Pract.* 1994; 38:583–8.
5. Ambika Gopalakrishnan Unnikrishnan, Usha V Menon, Thyroid disorders in India: An epidemiological perspective, Indian Journal of Endocrinology and Metabolism, PMID: 21966658, Year: 2011, Volume: 15, Issue: 6, Page: 78-81
6. Institute of Medicine (US) Committee on Medicare Coverage of Routine Thyroid Screening; Stone MB, Wallace RB, editors. Medicare Coverage of Routine Screening for Thyroid Dysfunction. Washington (DC): National Academies Press (US); 2003. 2, Pathophysiology and Diagnosis of Thyroid Disease. Available from:  
<https://www.ncbi.nlm.nih.gov/books/NBK221541/>
7. Dr. V. V.L. Prasuna. AYURVEDIC MANAGEMENT OF THYROID DISORDERS Published By : AYURVEDA FOR YOU [ HTTP://AYURVEDA-FORYOU.COM ] P. 67
8. Tripathi B, editor. *Madhav Nidana of Madhavkar.* Reprint Ed. Ch. 25, Ver. 1-5. Vol. 1. Varanasi: Chaukhabha Sanskrit Sanshtan; 2006. p. 571.
9. Tiller D, Ittermann T, Greiser KH, et al. Association of serum thyrotropin with anthropometric markers of obesity in the general population. *Thyroid* 2016; 26: 1205–14.
10. Dr. A.K.Pandey & P.S. Byadgi. A Text Book of Kayachikitsa, Vol-I, II & III, (1st Ed), Published by Chaukhamba Publications, (2013, 2014) 4262/3, Ansari Road, Darya Ganj, New Delhi-110002, India.
11. Acharya YT, editor. Charaka samhita of Agnivesha, Chikitsa sthana; Shvayathu chikitsa: chapter 12, verse 13. 5th ed. Varanasi: Chaukhamba Surbharati Prakashan; 2011. p. 483. Reprint 2016.
12. Acharya YT, editor. Charaka samhita of Agnivesha, Sutra sthana; Vividhashitapitiya Adhyaya: chapter 28, verse 9&10. 5th ed. Varanasi: Chaukhamba Surbharati Prakashan; 2011. p. 179. Reprint 2016.
13. Acharya YT, editor. Charaka samhita of Agnivesha, Viman sthana; Rasaviman Adhyaya: chapter 1, verse 16. 5th ed. Varanasi: Chaukhamba Surbharati Prakashan; 2011. p. 675. Reprint 2016.

ORIGINAL RESEARCH ARTICLE

14. Zulewski H, Müller B, Exer P, Miserez AR, Staub JJ. Estimation of tissue hypothyroidism by a new clinical score: Evaluation of patients with various grades of hypothyroidism and controls. *J Clin Endocrinol Metab.* 1997;82(3):771-6. <https://doi.org/10.1210/jcem.82.3.3810> PMID:9062480
15. Dr. V. V.L. Prasuna. AYURVEDIC MANAGEMENT OF THYROID DISORDERS Published By : AYURVEDA FOR YOU [ [HTTP://AYURVEDA-FORYOU.COM](http://AYURVEDA-FORYOU.COM) ] P. 67
16. Sharma P.V, editor. *Dravyaguna vijnana*, Vol.-2, Varanasi, India: Chaukhambha Bharati Academy, Reprinted 2003. p.737.
17. Sri lakshmi Sastri, editor. *Yog Ratnakar, Galaganda chikitsa*; verse 2. 7th ed. Varanasi: Chaukhambha Publication; 2011. p. 737.
18. Dr. G.S. Pandey Late., editor. *Bhavaprakash Nighantu (Indian Materia Medica)*, Haritkyadi varga: Chapter 2, verse 50 & 53. Varanasi, India: *Choukambha Bharati academy*. Reprint; 2015. p.15.
19. Kumar Suresh, Kamboj Jitpal, Suman, sharma Sunil. Overview for various aspects of the health benefits of piper longum Linn. fruit. *J Acupunct Meridian Stud.* 2011;4(2):134–140. ISSN: 2005-2301.
20. Atal CK. Occurrence of sesamin in Piper longum Linn. *Indian J Chem*, 1966; 4: 252.
21. Navin Atal, K. L. Bedi. Bioenhancers: Revolutionary concept to market. *Journal of Ayurveda & Integrative Medicine* 2010 April, Vol 1 | Issue 2
22. Duntas L.H., Benvenega S. Selenium: An element for life. *Endocrine.* 2015; 48:756–775. DOI: 10.1007/s12020-014-0477-6.
23. Finkel T, Holbrook NJ, "Oxidants, oxidative Stress and the biology of aging", *Nature*, 2000; 408(6809):239-47. DOI: 10.1038/35041687.