

BIRD'S-EYE VIEW OF FEMALE INFERTILITY DUE TO HYPERTHYROIDISM
(GRAVE'S DISEASE) – A CASE REPORTDr. Niharika Kamble^{1*}, Dr. Sipika Swati²¹Assistant Professor, PTSR Dept., Dr Rajendra Gode Ayurveda College, Hospital and Research Centre, Amravati, Maharashtra, India.²Associate Professor, PTSR Dept. ITRA Jamnagar, Gujrat, India.***Corresponding Author: Dr. Niharika Kamble**

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ABSTRACT

Introduction: One of the most underappreciated reproductive health problems in developing countries is the high rate of infertility. Grave's disease is the most common cause of hyperthyroidism. It is an autoimmune disease in which immune system attacks the thyroid, causing it to grow and release too much hormone. Menstrual changes associated with hyperthyroidism are unpredictable, ranging from menstrual irregularities to even infertility. Ayurveda doesn't emphasize the exact nomenclature of disease but features of *Athyagni* have striking similarity with the symptoms of hyperthyroidism. **Aim:** To study hyperthyroidism in Ayurvedic perspective & to establish Ayurvedic approach in female infertility with hyperthyroidism. **Methodology:** The basic and conceptual materials are taken from ayurvedic classics, research articles from renowned journals, modern textbooks and previous research works have also been looked thoroughly. A female patient aged 29 years with secondary infertility due to hyperthyroidism (Grave's disease) successfully conceived by *Virechana Karma* and *Shamana Aushadhi*. **Result:** Patient successfully conceived after 4 months of Ayurvedic treatment i. e. *Virechana Karma* along with *Shamana Aushadhi*. **Discussion:** *Agni* plays a very important role in the formation of *Ahara Rasa*. There is striking similarity between *Dhatwagni* and thyroid hormone metabolism. *Athyagni* leads to *Dhatupaka Avastha* in multiple *Dhatus* which eventually leads to *Kshaya* of *Rasadi Dhatu*. The whole process is mediated by *Athyagni* in *Koshta* and *Dhatu*. *Virechana* is used as *Shodhana* therapy leads to *Pittashamana* which is predominant in *Athyagni*. *Acharya Charaka* has mentioned *Ghrita* as line of treatment and also good for *Pittashamana*. *Kalyanaka Ghrita* is used as *Shamana Sneha* which is *Punsavaneshu Param* and helpful in *Vandhyatwa*. A better understanding of the pathogenesis of hyperthyroidism through the fundamentals of Ayurveda helps to obtain a cure that is safe, conservative and definitive which is possible through Ayurveda.

KEYWORDS: - Hyperthyroidism, Athyagni, Grave's disease.**INTRODUCTION**

Infertility, defined as the inability to conceive after at least 1 year of unprotected sexual intercourse, affects about 15% of couples, and it is particularly common in developing countries.^[1] Male and female partners alone are responsible for 20–30% of cases, respectively, but contribute to 50% of cases overall.^[2] There is a close link between thyroid function and female fertility: physiologically, pregnancy has a significant effect on the thyroid gland, and thyroid dysfunction has long been associated with female infertility^[3] with both obstetric and fetal outcomes being well established.^[4] Hyperthyroidism is the condition where

there is hyper metabolism in the body due to the excessive production of thyroid hormones T3 and T4. For growth, neuronal development, reproduction and regulation of energy metabolism thyroid hormones are essential. Hypothyroidism and hyperthyroidism are common conditions which affect all populations worldwide with potentially devastating health consequences. Hyperthyroidism is an emerging health problem in worldwide population. Approximately 300 million people worldwide are affected by thyroid dysfunction as it is a common endocrine disorder.^[8] Globally about 1-5% population are affected by hyperthyroidism. It is more prevalent in females which

causes menstrual irregularities, infertility and other issues.^[4] In Ayurvedic literature, this TSH is called *Jatru Agni*, and it is the bridge between *Jathara Agni*, *Bhuta Agni*, and *Dhatu Agni*. All these types of *Agni* are governed by the pituitary gland via the thyroid gland, through the mechanism of thyroid stimulating hormone (*Jatru Agni*). Graves, disease occurs when the thyroid gland produces too many thyroid hormones, which is a condition of high *Jatru Agni*, resulting in fast metabolism, protruded eyes, and strong appetite.^[5] The *Agni* located in the *Jathara* (digestive fire) is responsible for digestion and absorption of the food. The *Bhutagni* is responsible for transformation of heterogeneous substance to homogenous substances. The *Dhatwagni* (the *Agni* located in the body tissues) along with *Bhutagni* are responsible for the metabolism. Hyperthyroidism is treated with anti- thyroid medications, radioactive iodine, beta-blockers and thyroidectomy in contemporary medicine which may cause lots of complications and adverse effects in the long run. So, a safe alternate treatment modality is very necessary to address that problem, for which Ayurveda is the best option. In Ayurveda there is no direct mention of the thyroid gland and hyperthyroidism. Since Hyperthyroidism and *Bhasmak Roga* both have similar pathogenesis i. e., hypermetabolism, they can be correlated with each other. *Bhasmak Roga* is caused by *Atyagni* or *Tikshnagni*. *Tikshnagni* is due to *Pittaprakopa*. Symptoms of *Pittaprakopa* are similar to *Bhasmak Roga*. Various Acharya had mentioned about *Bhasmak Roga* in various centuries in various Ayurveda Samhitas. Acharya Charak had mentioned *Bhasmak Roga* as *Tikshnagni* in *Grahanirog Chikitsa Adhyaya*. According to Charak, *Ksheen Kapha* and *Prakopa* of *Vata* and *Pitta* causes *Jatharagni vriddhi* (increased digestive fire). Because of this *Kshudhavriddhi* (increased appetite) and *Trishnadi* (excessive thirst) etc., symptoms are seen. If the patient does not take food then this increased *Jatharagni* leads to *Dhatu-Pachan-Karshytwa* (depletion of tissue and cachexia) and *Mrityu* (death).^[6]

MATERIALS AND METHODS

A female patient aged 29 years with secondary infertility due to hyperthyroidism (Grave's disease) visited to OPD of Streeroga Evum Prasuti Tantra of our institute on 9th June 2022. She had a previous history of LSCS due to pregnancy induced hypertension. After that she diagnosed with hyperthyroidism and had taken regular medications for same, but she didn't conceive. So, for better management of secondary infertility with hyperthyroidism she approached to the OPD of PTSR department of our institute.

Clinical Findings

Menarche: - 14 years

Married life: - 11 years

Menstrual history:

Duration – 3 days,
Interval – 29-30 days
Painless, without clots
3-4 pads/day, fully soaked

Contraceptional history: - Nil

Coital history: - 2-3 times/week

No dyspareunia

No burning sensation

General examination

Height - 142 cm

Weight - 48 kg,

Body mass index - 25 kg/m²

Blood pressure - 116/72 mm Hg.

Appetite – Good

Sleep – Sound

Urine – Regular

Bowel – Satisfactory

Systemic examination

Central Nervous System – Patient was conscious and well oriented

Cardiovascular System – S1 & S2 normal, no abnormal sounds were heard

Respiratory System – Bilateral clear, no added sound was there

Per Abdomen examination – Soft, non-tender

Per speculum & per vaginal examination

Mild sticky discharge present

Cervix healthy, no congestion

Uterus anteverted anteflexed non-tender

Cervix – firm, CMT – absent

Bilateral adnexa clear

Bilateral fornixes clear

The patient's *Dasha Vidha Pariksha* (Tenfold of comprehensive bio-psycho-spiritual clinical review) was revealed as *Pittapradhana Kaphanubandhi* (~genetic constitution). Sara (~tissue excellence), Satva (~psychic condition), and Satmya (~homologation) were *Madhyama*. The *Vyayama shakti* was *Madhyam* (~power of performing exercises), *Abhyavaharana* (~power of appetite), and *Jaranashakti* (~digestive power) were *Uttam* (~ Very good). The patient's *Asta Vidha Parikshya* (eight-fold examination) as *Kapha Pitta Nadi*, normal Micturition and evacuation of bowel, *Nirama* (~non-coated) tongue and slightly central obesity in *Akruti* (~general appearance).

RESULT AND DISCUSSION

Timeline

Patient was in regular follow-up since June 2022. After these 4 months of treatment-protocol she conceived and her LMP was 25th December 2022. Then Tab. PTU 50 mg was started during pregnancy 1 tablet thrice in a day. Now she delivered a full-term male baby per vaginally on 5th September 2023 without any complication. The timeline of the treatment is presented in Table 1.

Diagnostic Assessment

The diagnosis of hyperthyroidism was made on the basis of history of patient and medication taken for that. The thyroid function tests are shown in Table 2.

Therapeutic Intervention

In first cycle, *Virechana Karma* was planned mentioned in Table 3. After that oral medications were given to the patients for 3 months mentioned in Table 4.

Follow-up and Outcome

Patient was in regular follow-up since June 2022. After these 4 months of treatment-protocol she conceived and her LMP was 25th December 2022. *Shamana Aushadhi* given to patient during her antenatal period (mentioned in Table 5) and *Garbhini Paricharya* was advised to patient. Then Tab. PTU 50 mg was started during pregnancy 1 tablet thrice in a day. Now she delivered a full-term male baby per vaginally on 5th September 2023 without any complication.

DISCUSSION

Due to the multifactorial etiology and involvement of *Dosha Dushya Sammurchhana* at the cellular level, *Shodhana* is essential in the management infertility. *Acharya Kashyapa* mentioned that *Indriyaa* get clarified, *Uttarottara Dhatu* clarification is there which leads to *Beeja Karmukatvakam*.^[7] *Virechana* also has *Raktaprasadana Karma*. It normalizes the ovarian functions by its purifying action (Bio cleansing property). *Acharya Charaka* has mentioned *Virechana* in *Pakvashyagata Dosha*^[8] and *Pakvashaya* is the main *Sthana* of *Vata Dosha* so it regulates vitiated *Vata* along with *Kapha* and *Pitta*. Thus, *Samshodhana Karma* clear the *Strotas* and regulates function of *Tridosha* specially *Avrita Apana Vayu*.

In Ayurveda *Ghrita* is considered as *Nitya Rasayan*.^[9] It is sweet in taste, provide softness to the body tissues and cold in potency. The properties of *Ghrita* are to alleviate *Vata* and *Pitta* without increasing *Kapha*. Probable mode of action of *Kalyanaka Ghrita* can be evaluated on the basis of *Rasa Panchaka*. Majority of the drugs are having *Tridoshashamaka*, *Deepana-Pachana*, *Vrishya*, *Rasayana*, *Yonidoshahara*, *Garbhashtapaka* properties. *Haridradaya*, *Sarivadaya*, *Ela*, *Talisa*, *Vidanga*, *Devadaru*, *Nirgundi*, *Amalaki* etc have *Deepana*, *Pachana* and *Amadoshanashak* properties so that it regulates *Jatharagni*, *Dhatvagni* and *Bhutagni* which corrects metabolism at cellular level, results in proper formation of *Dhatu*s and *Upadhatu*s (*Artava*) and *Strotoshodhan* by removing *Ama*. *Haritaki*, *Amalaki*,

Vibhitak, *Visala*, *Danti* have the *Sara Guna* and *Virechak* action so that they regulate *Doshas* by *Samshodhana Karma*. *Triphala*, *Elavaluka*, *Haridra*, *Daruharidra*, *Ela*, *Manjistha*, *Kustha* have *Yoni doshahara* action i.e it alleviates local inflammation and infection and it is mentioned in our classics that conception only occurs in *Shuddha Yoni*.^[10] *Sarivadaya*, *Shalaparni*, *Prishniparni*, *Dadima* etc drugs and *Ghrita* itself have *Madhura rasa*, *Prithvi Jala Mahabhuta Pradhana* and *Brihana* property which is responsible for *Upachaya* thereby improves the endometrial thickness. Essential oil and alcohol extract of *Valeriana wallichii* exerted good peripheral analgesic action via inhibition of PG synthesis on acetic acid induced writhing.^[11] *Stigmasterol* present in *Nirgundi* and *Kustha* is precursor of progesterone, acts as intermediate in the biosynthesis of androgens, estrogens and corticoids and possesses antioxidant, hypo-glycemic and thyroid inhibiting properties.^[12] *Ghrit* has *Yogvahi*, *Agnideepaka*, *Rasayana*, *Vrishya*, *Vata Pitta Shamaka* action and overcomes vitiated *Kapha Dosha* due to *Samskar anuvartana Guna*. According to modern science, *Ghrita* is lipophilic in nature, thus it diffuses rapidly across the cell membrane which is also composed of bimolecular lipid matrix. *Ghrita* contains the cholesterol which is responsible for the synthesis of steroid hormones i.e estrogen and progesterone. performs its two functions properly - *Vibhajana* i.e reduction division in oocyte and proliferation of granulosa cells and responsible for development of follicle along with *Kapha* and *Pravartana* i.e. rupture of follicle which leads to ovulation. *Kalyanaka Ghrit* is use during pregnancy, it helps in better mental growth of fetus. It balances *Vata* and *pitta dosha*.^[13] *Garbha Chintamani Rasa* helps to prevent any congenital malformation of fetus during pregnancy. *Shatavari Churna* helps in digestion specially in excess *Pitta* condition. Also, it inhibits teratogenic effect in fetus. *Yashtimadhu Churna* regulates menstrual cycle and promote hormonal imbalance. It is anti-inflammatory drug which helps in implantation. *Shunthi* serves as detoxifying agent. *Arjuna* is having anti-oxidants, anti-inflammatory and anti-microbial properties. It is rich in zinc which regulate female germ cell growth, fertility and pregnancy. *Chitrakamoola* contain an alkaloid called plumbagin which is having various therapeutic properties like antioxidant, antibiotic and antifertility. *Brahmi* helps to reduce the symptoms of mental illness like anxiety and depression. *Bala*, *Shatavari*, *Guduchi* and *Yashtimadhu* help in *Garbhashtapana*. *Amalaki Churna* act as *Rasayana* and it helps to enhance the immunity and protects the body from various infections.

Probable mode of action of *Kalyanaka Ghrita* can be evaluated on the basis of *Rasa Panchaka*. Majority of the drugs are having *Tridoshashamaka*, *Deepana-Pachana*, *Vrishya*, *Rasayana*, *Yonidoshahara*, *Garbhasthapaka* properties.

Haritradaya Ela, Devadaru Amalaki	Sarivadaya Talisa, Vidanga Nirgundi	Deepana, Pachana Amadoshanashak properties which regulates Jatharagni Dhatvagni and Bhutagni which corrects metabolism at cellular level, results in proper formation of Dhatus and Upadhatus (Artava) and Strotoshodhar by removing Ama
Haritaki, Visala, Danti	Amalaki, Vibhitak,	Sara Guna and Virechak action so that they regulate Doshas by Samshodhana Karma.
Triphala, Daruharidra, Kustha	Elavaluka, Haridra, Ela, Manjistha,	Yoni doshahara action i.e it alleviates local inflammation and infection and it is mentioned in our classics that conception only occurs in Shuddha Yoni.
Sarivadaya, Prishniparni, Dadima	Shalaparni,	responsible for Upachaya thereby improves the endometrial thickness
Essential oil and alcohol extract of Valeriana wallichii		good peripheral analgesic action via inhibition of PG synthesis on acetic acid induced writhing.
Stigmasterol present in Nirgundi and Kustha		precursor of progesterone, acts as intermediate in the biosynthesis of androgens, estrogens and corticoids and possesses antioxidant, hypoglycaemic and thyroid inhibiting properties.

Table 1 – Timeline.

Events	Timeline
A female patient aged 29 years with secondary infertility due to hyperthyroidism (Grave's disease) visited to OPD of Streeroga Evum Prasuti Tantra of our institute. <i>Deepana Pachana</i> was given to the patient and <i>Pathya Apathya</i> were also advised to the patient.	9 th June 2022
<i>Virechana Karma</i> was done.	11 th July 2023
First follow up after <i>Virechana Karma</i> , <i>Shamana Aushadhi</i> given to the patient. Patient has advised to follow diet plan along with exercise.	August 2023
In second follow up, same medications along with diet and exercise were advised to the patient.	September 2023
In third follow up, same medications along with diet and exercise were advised to the patient.	October 2023
In fourth follow up, same medications along with diet and exercise were advised to the patient.	November 2023
After these 4 months follow up period she conceived.	LMP was 25 th December 2022.
She delivered a full-term male baby per vaginally on 5 th September 2023 without any complication.	

Table 2 – Thyroid function test.

Date	Results
5 th August 2023	Free T3 – 3.04 pg/ml Free T4 – 0.798 ng/dl Sr. TSH – 1.850 uIU/m
3 rd July 2023	Free T3 – 2.78 pg/ml Free T4 – 0.894 ng/dl Sr. TSH – 1.720 uIU/ml
7 th June 2023	Free T3 – 3.49 pg/ml Free T4 – 0.943 ng/dl Sr. TSH – 1.810 uIU/ml

Table 3 - Virechana Karma.

No.	Procedure	Drug & Dose	Duration
1.	<i>Deepana, Pachana</i>	<i>Shunthi Churna</i> 1 gm <i>Haritaki Churna</i> 2 gms <i>Guduchi Churna</i> 3 gms with warm water before meal twice in a day. (As per <i>Kostha</i> and <i>Agni</i>)	7 Days
2.	<i>Snehapana</i>	<i>Kalyanaka Ghrita Paan</i> (As per <i>Kostha</i> and <i>Agni</i>)	5 Days
3.	<i>Abhyanga Swedana</i>	<i>Bala Taila</i> (<i>Sida cordifolia</i> Linn)–1 time a day, <i>Dashmoola Vashpa Nadi Swedana</i>	4 Days

4.	Virechana Karma (11 th July 2022)	Trivrutadi Avaleha – 70 gm (As per <i>Koshta</i> and <i>Agni</i>)	1 Day
5.	Sansarjana Karma	Madhyam Shuddhi	5 Days

Table 4 – Shamana Aushadhi.

No.	Dravya	Matra	Kala	Anupana
1.	Kalyanaka Ghrita	10 ml	Empty stomach in morning and evening	Luke warm water
2.	Tab. Garbha Chintamani Rasa	1 tablet	After food once in a day	Water
3.	Shatavari Churna Yashtimadhu Churna Shunthi Churna	2 gm 1 gm 1 gm	After food twice in a day	Water
4.	Arjun Churna Bramhi Churna Chitrakamoola Churna	3 gm 1 gm 500 mg	Empty stomach in morning and evening as <i>Ksheerpaka</i>	-

Table 5 – Shamana Aushadhi (After conception).

No.	Dravya	Matra	Kala	Anupana
1.	Kalyanaka Ghrita	10 ml	Empty stomach in morning and evening	Water
3.	Tab. Garbha Chintamani Rasa	1 tablet	After food once in a day	Water
4.	Bala Churna Shatavari Churna Guduchi Churna Yashtimadhu Churna	2 gm 2 gm 1 gm 1 gm	Empty stomach twice in a day (morning and evening)	Milk
5.	Amalaki Churna	3 gm	After food twice in a day	Sharkara

CONCLUSION

Ayurvedic classics have no direct reference of hyperthyroidism. Considering various factors, it can be compared with *Atyagni* or *Tikshnagni* or *Bhaskama Roga* as all of them effect on the body's metabolism. Globally, about 1-5% population are affected by hyperthyroidism. Graves' disease occurs in 0.4–1.0% of women before pregnancy and about in 0.2% during pregnancy.^[14] Though prevalence of infertility due to hyperthyroidism is rare but it can cause various abnormalities before and after conception. The treatments of Hyperthyroidism in contemporary medicine have lots of adverse effects and complications, debilitating the patient condition in the long run. Therefore, Ayurvedic approach to treat infertility associated with hyperthyroidism is invariably necessary to avoid the various side effects. This case study reveals very promising efficacy of *Shodhana* and *Shamana Chikitsa* along with proper *Dinacharya*, *Ahar-Vihara*, *Pathyapathya* in infertility due to hyperthyroidism.

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