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A Case Study: Management of Hypothyroidism through Ayurveda Medication

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Abstract: One of the most common endocrine disorders seen in daily practise is hypothyroidism. Hypothyroidism is caused by a lack of thyroid hormone or resistance of body tissue to thyroid hormone in relation to metabolic demand. Although diagnosis and treatment of hypothyroidism are frequently thought to be simple, a large number of people with this condition receive suboptimal care. Thyroid disorders are common in India, with hypothyroidism being a condition that is currently not adequately controlled. Because of the disease's broad scope and high prevalence in society, the current issue was chosen for study and management using Ayurveda principles. 60 years old male patient on 10/03/2023 came to OPD of Shalakya Tantra, Parul Ayurved Hospital, Parul University, Vadodara with general body weakness, breathlessness, voice fatigue, dryness, difficulty in swallowing big tablet since a year. Primarily he had steroid therapy for 10 days in November, 2022 but he wanted to be on Ayurveda medication completely. In an interval of 30 days, complete Ayurveda treatment was given, patient was symptomless and TSH level reduced from 15.96 micro IU/ml to 7.77 micro IU/ml.

Keywords: *Endocrine disorders, Hypothyroidism, Thyroid diseases, Thyroid, Hyperthyroidism, Myxoedema, Pippali Rasayan, Vardhman Pippali, Galaganda.*

1. Introduction

Thyroid disorders are the most common among all endocrine diseases in India. Hypothyroidism is a progressive disorder of Thyroid gland due to an insufficient amount of thyroid hormone. It is characterized by a broad clinical spectrum ranging from an over state of myxoedema, end organ effects and multisystem failure to an asymptomatic or subclinical condition with normal levels of thyroxin and triiodothyronine and mildly elevated levels of serum thyrotropin. The thyroid is an important part of the human endocrine system, which are responsible for regulation of oxygen use, basal metabolic rate, cellular metabolism and growth and development. The thyroid gland secretes thyroxine (T4) and Tri Iodothyronine (T3), which are needed for proper growth and development and which are primarily responsible for determining the basal metabolic rate. The thyroid hormones are transported through the blood and act at the cellular level. Through the activation of genes, thyroid hormones stimulate protein synthesis, promote maturation of nervous system, and increase the rate of cell respiration in tissues, thus elevating the BMR. According to a recent projection from various studies, it has been estimated that about 42 million people in India suffer from thyroid diseases. The prevalence of hypothyroidism in urban India is 10.95% with a greater incidence in females and elderly persons. About 1 to 2% of the adult population is known to suffer from thyroid disorders. Thyroid dysfunction is two types i.e over activity and under activity. In Hypothyroidism thyroid gland does not produced enough thyroid hormone. Hypothyroidism can be described as underactive thyroid. Infertility, weight problems, depression and chronic tiredness the most frequent complications of hypothyroidism. Auto immunity plays a significant role in the aetiology of hypothyroidism. Every one out of five patients presents with one or other autoimmune disorder. The disease hypothyroidism causes complications like dyslipidaemia which is a major risk factor for many serious illnesses. The hypothyroidism itself in its peak can result in life threatening condition. The treatment ties

of the hypothyroidism are also having many adverse effects like depression, nervousness and anxiety. So it is the need of time to look for a safe and effective treatment of hypothyroidism in Ayurveda. There is no direct reference of hypothyroidism in Ayurveda, whereas the description of Galaganda and Gandamala have been frequently mentioned in the different Samhitas. Galaganda, characterized by neck swelling, is well known. The symptoms of Galaganda and Hypothyroidism are vaguely similar.

- The description of swelling in the neck was mentioned in *Atharva Veda* by the name of Apachi.
- *Charaka* described multiple *Granthi* around the neck is called *Gandamala* and single swelling on the side of the neck is Galaganda (Agnivesha et al., 2014). He mentioned about the disease under the *Nanatmaja Kaphaja Roga* (Ch. Su.20/17) and also presented that *Galaganda* is a solitary swelling in 11th chapter of *Chikitsa Sthana* of *Charak Samhita*. Charaka mentioned, *Galaganda* is mainly originated due to provoked *Kaphadosha*. According to *Sushruta*, aggravated Vata and *Kapha* doshas in the neck having accumulated in *Manya* and along with *Medas* produce glandular enlargement with their characteristic symptoms.
- *Sushruta* in *Sareera Sthana* mentioned in the sixth layers of the skin i.e. Rohini is the seat of Galaganda (Su.Sa.4/4). In *Nidana Sthana* he described the disease Galaganda as two encapsulated small or big swellings in the anterior angle of the neck, which hang like scrotum (Su.Ni.11/22).
- *Sushruta* characterizes *galganda* as being caused by vata (vataja), kapha(*kaphaja*) or medas, fat tissue (*medaja*). The first two are genuine goitres and the latter a cyst or tumor.
- According to Acharya Vagabhata Kapha associated Pitta dushti with vitiation of Vata due to Margavarna and predominantly Rasa-Vaha, Medo-Vaha and Mamsa-vaha Sroto-dushti can be considered as cause of this disease (Pandit Hari et al., 2011). The signs and symptoms of hypothyroidism nearly relate to a condition called as Galaganda and some of the kaphaja nanatmaja vyadhis (Vaidya Yadavji Trikamji Acharya, 2009). From the above descriptions Galaganda can be correlated with Goitre or hypothyroidism.

As said by Acharya Charaka, Jatharagni (Principal Fire) is the reason of life, color, strength, health, enthusiasm, plumpness, complexion, Ojas (Immunity), Tejas (Luster), other varieties of Agni (Fire) and Prana (Life).

Extinction of this Jatharagni (Principal Fire) leads to death; its proper maintenance helps a person to live a long life, and its impairment gives rise to diseases. The concept of Agni (Fire) is very much unique in Ayurveda. Based on these symptoms, Hypothyroidism in Ayurveda it can be considered under a disease arising from malfunctioning of Agni (Fire) or Agnidushti (Malfunctioning of Fire).

Due to various ill dietary habits and lifestyle modifications, the Agnidushti (Malfunctioning of Fire) occurs and thus there is the formation of Ama (Undigested Food) as described by Aacharya Vagbhata. The Sama Dosha (Humors with undigested food) Lakshana (symptoms) include:-

1. Obstruction of the channel
2. Loss of strength
3. Feeling of heaviness in the body
4. Inactivity of vata (Air element in our body)
5. Lassitude
6. Loss of digestive power
7. More of expectoration
8. Accumulation of wastes
9. Anorexia
10. Exhaustion

Clinical presentation of hypothyroidism also exhibits same symptoms like lethargy, fatigue, sleepiness, loss of appetite. Diagnosis is usually based on one test, that of the Thyroid Stimulating Hormone (TSH.) If the results of the TSH test are normal, it is inferred that the thyroid is functioning normally. The contemporary management is hormone replacement therapy by Levothyroxine . The daily replacement is needed ie.1.6µg/Kg body weight (average 100- 150µg. Levothyroxine is Synthetic T4 un- der brand names Levothyroid, Levoxyl, Synthyroid, Tirosint, Unithroid, Thyro- norm, Eltroxin, Cytomel, Thyrolar. Dosage is increased gradually until TSH blood levels normalize. The major risk of Levothyroxine sodium therapy is over-replacement, anxiety, muscle wasting, osteoporosis, and atrial fibrillation

Case Report
A 60 year old male patient came to OPD no. 112, Parul Ayurved Hospital, Parul University with Chief complaints of Dryness, Weakness, Voice fatigue, Breathlessness etc. since one month. After taking proper history, the patient was done for investigations of blood Hb%, fasting blood sugar, total lipid profile, T3, T4, TSH etc. After seeing the report, the patient was diagnosed as hypothyroidism. He had no family history for similar conditions and no significant past history. He also had no any history of hypertension, diabetes, cardiac problem or any other complicated diseases.

Personal Examination
Age – 60 years Height – 5.9
Weight - 61 kg Temperature – 98 F

Physical Examination
Asthvaidh Pariksha
- *Nadi* (Pulse) – *Kaphaja (86/min)*
- *Mutra (urine) –Samyak mutra pravritti ,pale yellow*
- *Mala (stool) – Alpa (scanty)*
- *Jiwha (tongue) – Sama (coated)*
- *Shabda (voice) – Sankuchit (fatigue)*
- *Sparsha (touch) – Sheeta (cold)*
- *Drika (eye) – Samanya (normal)*
- *Aakriti (physical structure) - Madhyama (medium*)
- *Bala = Madhyama*

Dashvidha Pariksha
- Prakriti (Physical constitution) - VataPittaja
- Vikriti (Morbidity) – Vikriti Vishama Samveta
- Sara (Excellence of Dhatus) – Rakta
- Samhanana (Compactness of organs) – Madhyama (Medium)
- Pramana (Measurement of the organs of the body) – Madhyama (Medium)
- Satmya (Homologation) – Madhyama (Medium)
- Satva (Psychic conditions) – Madhyama (Medium)
- Vaya (Age) – Praudha (Adult)
- Vyayam Shakti (Power of performing exercise) – Avara (Less)
- Ahar Shakti (Power of intake and digestion of food) – Avara (Decreased)
- Family History- Brother has same disease (Monozygotic twin)
- Past history- No significant past history

2. Material and Methods

The treatment was planned seeing the state of Roga bala (strength of the disease) and Aturbala (strength of the patient).The treatment like
- Amapachak (digestion of undigested food),
- Agnideepan (increasing appetite),
- Anuloman (proper bowel movement),
- Medohara (anti obesity) and
- Vatakaphanasak properties

Following medicines were administered to the patient-

S. No.	*Aushadha*	*Dose*	*Duration*	*Anupana*	
1.	AAMPACHAN VATI	3 TAB	BD	Luke warm water	Empty stomach
2.	SHIVA GUTIKA	3 TAB	BD	Luke warm water	After meal
3.	VARDHMAAN PIPPALI	As per Dose		Go Dugdha	8 AM
4	GO GHRITA	4 TSF	BD		
5	ELA + SHARKARA	2 TSF	BD		

Course of Vardhamana Pippali

Dried Pippali (Piper longum) fruits were procured and finely powdered at the parul ayurveda pharmacy. One Pippali is the starting dose for this *vardhamana pippali Rasayana*. Hence 1 small pippli was weighed which accounted for 0.23 g. The powder was then weighed as per the day-wise dosage (20 days) and packed in small air-tight packets.

Ascending Pattern				**Descending Pattern**			
Day	Date	Number of Pippalis	Wt. in grams	Day	Date	Number of Pippalis	Wt.in grams
1	16-03-2023	1	0.23	11	26-03-2023	10	2.30
2	17-03-2023	2	0.46	12	27-03-2023	9	2.07
3	18-03-2023	3	0.69	13	28-03-2023	8	1.84
4	19-03-2023	4	0.92	14	29-03-2023	7	1.61
5	20-03-2023	5	1.15	15	30-03-2023	6	1.38
6	21-03-2023	6	1.38	16	31-03-2023	5	1.15
7	22-03-2023	7	1.61	17	01-04-2023	4	0.92
8	23-03-2023	8	1.84	18	02-04-2023	3	0.69
9	24-03-2023	9	2.07	19	03-04-2023	2	0.46
10	25-03-2023	10	2.30	20	04-04-2023	1	0.23

The treatment was continued for 1 months. 500 ml of milk and 50 grams of go *ghrita* was added to daily diet. The patient was advised as per *Ayurvedic* fundamental principles to avoid apathya *ahara* (food) and *Vihara* (daily activities) like fast food and junk food, cabbage, cauliflower, soyabean, excessive sleep and other sedentary life style etc. He was advised to indulge pathyas like light diet, other green vegetables, sea food, old rice, barley and aerobic exercises etc.

3. Observation and Results

Showing daily treatment with prognosis.

		Before Treatment	After Treatment
1	Dryness	**Moderate**	**Mild**
2	Weakness	**Severe**	**Mild**
3	Voice fatigue	**Severe**	**Cured**
4	Breathlessness	**Mild**	**Cured**

Showing changes in thyroid reports of Laboratorial Findings

Thyriod Profile				
		Before	**During**	**After**
1	**S.TSH**	**15.96 micro IU/ml** (10/03/2023)	**7.7 micro IU/ml** (09/04/2023)	**8.5820** 01-05-2023
2	**Free T-4**	**0.9 ng/dl**	**0.8 ng/dl**	**0.80**
3	**T-3**	**1.18 ng/ml**		
4	**FBS**	**156mg/dl**	**134 mg/dl**	**87 mg/dl**

4. Discussion

Owing to the predominance of *Kapha* and *Vata* Dosha along with deranged metabolism, Pippali which mainly possesses *Vata–Kaphahara* with Agni deepana (Bio-fire enhancer) and Rasayana (Rejuvenating) properties seems to be promising in Hypothyroidism. Studies suggest *Vardhamana Pippali Rasayana* acts by correcting Agni, does purification of micro channels by exerting *Vata kaphahar* property, and by increasing supply and assimilation of micronutrients to tissues in *Hypothyroidism* (Singh et al., 2015). The Rasayana property of Pippali further augments the therapeutic effects and as the clinical picture of Hypothyroidism is similar to conditions indicated for the administration of *Vardhamana Pippali* the current study was structured to evaluate the efficacy of pippali in different dosage patterns i.e., *Vardhamana* (Increasing & decreasing) and fixed dosage form, where the total quantity of *Pippalis* administered i.e., 300 *Pippalis* (69 g) and timespan of treatment in both forms were same.

Hetu of subclinical- Hypo thyriodism
Ahar

- Improper and irregular diet.
- Chiken, Matsya sevan (3 times in week)
- Dadhi (twice in week) iv. Biscuit (daily with milk)
- Dosa, idali ,sandwich (daily)
- Daily empty stomach water (4-5 glass per day)

Vihar

i. Prolong seating
ii. Ratri jagran
iii. Excessive sex / Masturbation

Manasika nidan: *Chinta*, *vegavrodha* causes vata vrudhi
Sanprapti Ghatak

- Dosh: vata-kapha.
- Dushya: Rasa, Rakta, shukra

Vikalpa Samprapti

- Vata dosha- sheeta Guna
- Kapha dosha- manda, sheeta, guru Samprapti

Showing how to Diagnosis of hypothyroidism with T3, T4, TSH levels

S.N	TSH	T4	Interpretation
1	Normal	Normal	Normal thyroid function
2	Elevated	Low	Over-Hypothyroidism
3	Normal	Low	Central Hypothyroidism
4	Elevated	Normal	Subclinical Hypothyroidism

Showing action of drug & other procedure done in study.

S.N.	Drug	Action
1	Aampachan Vati	Aam pachan
2	Shiva Gutika	Sroto-shodhana, lekhana and agni deepana
3	Vardhmaan Pippali	Rasayan

Chausath Prahari pippali is a type of *churna kalpana* which has *pippali* as a principle drug. *Chausath prahari pippali* is prepared from pippali by triturating choti pippali with juice of badi pippali for 64 Prahar or 192 hours (Prahar is a Sanskrit term for a unit of time and it is approximately three hours long). It has carminative, stimulant, laxative, *thermogenic*, anti-cough and appetizing properties Pippali has katu rasa, ushna virya, madhur vipaka, tikshna and laghu guna. It acts as hetu viparit (against cause), vyadhi viparit (against disease i.e. Yakrit plihagna), dosha viparit (kaphavatahara, tridosh hara, pittavirodhi) and as rasayana. Piperine was found to enhance the bioavailability of structurally and therapeutically diverse drugs, possibly by modulating membrane dynamics due to its easy partitioning and increase in permeability of other drugs such as vasicine, indomethacin, diclofenac sodium etc. It was suggested that piperine might be inducing alterations in membrane dynamics and permeation characteristics, along with induction in the synthesis of proteins associated with the cytoskeletal function, resulting in an increase in the small intestine bsorptive surface, thus assisting efficient permeation through the epithelial barrier. Mardana process converts the particle size of a substance. Reduction in particle size increases the surface area of the drug which helps in easy digestion and assimilation. Thyroid hormones also stimulate mitochondrial respiration, leading to an increase in reactive oxygen species release in the respiratory chain. Overproduction of thyroid hormones therefore causes oxidative stress through the overproduction of free radicals, unlike in hypothyroidism, where redox imbalance can be attributed to an inefficient antioxidant defence system. Consequently, overproduction of thyroid hormones (hyperthyroidism) may be associated with oxidative damage to cell structures. Individuals with hyperthyroidism present higher rates of lipid peroxidation than euthyroid individuals, which is indicative of oxidative damage to membrane lipids. In addition, in a study investigating the effects of lead exposure on the parameters of thyroid function and antioxidant markers, thyroid hormones were shown to be positively correlated with MDA, with a positive relationship between TSH and glutathione. These findings suggest a close relationship between hyperthyroidism

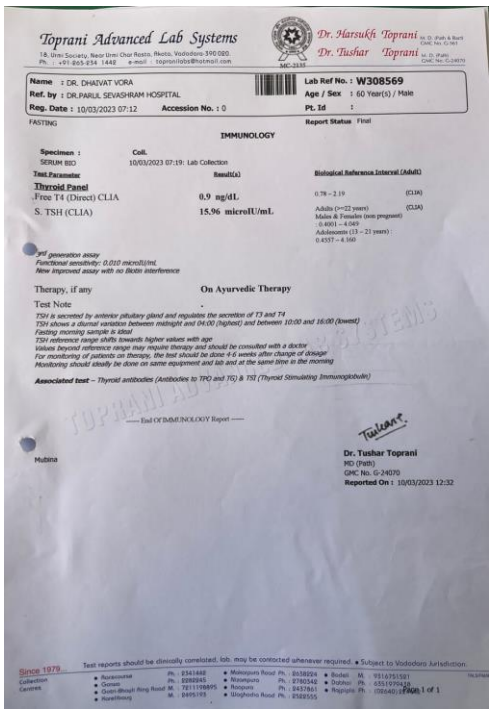
and the progression of oxidative stress. In hypothyroidism, including its subclinical form, elevated levels of MDA have been noted, compared to healthy individuals. Apart from inadequate antioxidant defence, this may be related to altered lipid metabolism in thyroid cells. The treatment of hypothyroidism, despite lowering lipid peroxidation levels, does not bring serum MDA concentrations down to the levels observed in healthy individuals, but it may significantly boost SOD activity. The relationship between hypothyroidism and oxidative stress is probably based on the lower activity of the internal antioxidant system, which does not provide adequate protection to cells against free radical accumulation, leading to oxidative damage. Similarly, a mutation in the gene encoding NOX activity may contribute to excessive stimulation of ROS production. Accumulation of oxygen free radicals may inhibit TPO activity, consequently interfering with thyroid hormone production and leading to the development of hypothyroidism. In free radical theories how free radical form in body, it is common knowledge by now a days that oxygen, though crucial for life process produces highly reactive substance called free radical, as by product of ATP. These free radical form in body by the consumption of unwholesome diet or free radical diet. So due to unwholesome diet the production of free radical in body get increases and these free radicals can damage any part of body and may result in many serious diseases. Free radicals are produced in mitochondria, and damage protein, lipids, nucleic acids of cells and mitochondria themselves – especially their DNA. The resultant DNA alterations and mutations lead to ageing and age-related degenerative diseases like progressive dementia, vision loss, neurosensory deafness and abnormal cardiac and renal functions

5. Conclusion

In this era where lifestyle disorders being common due to altered & sedentary life style, Ayurveda provides the best therapy to heal body, mind and soul. Hypothyroidism can be considered as condition which refers to Agni Dushti (Malfunctioning of Digestive Fire). Agnimandya (Low Digestive Fire) is precursor factor of all the diseases resulting in Ama (Undigested food) formation. Symptoms of Ama (Undigested food) and hypothyroidism are almost similar. Treatment of Ama (Undigested food) gives significant result in Hypothyroidism. Therefore, Hypothyroidism can be managed with the treatment which is fully based on principles of Ayurveda. In this case, the medication gave encouraging results. After treatment TSH- 7.7uIU/ml (09/04/2023) during 30 days of treatment patient was strictly on only ayurved medication & diet.

Source of support
Parul Ayurveda Hospital, Parul institute of Ayurveda, Parul University, limda Vadodara, Gujarat.

Conflict of interest: There are no conflicts of interest.



Toprani Advanced Lab Systems

Dr. Harsukh Toprani
Dr. Tushar Toprani

Name : DR. DHAIVAT VORA
Ref. by : DR.PARUL SEVASHRAM HOSPITAL
Reg. Date : 10/03/2023 07:12 Accession No. : 0
Lab Ref No. : W308569
Age / Sex : 60 Year(s) / Male
Pt. Id :
Report Status Final

FASTING

IMMUNOLOGY

Test Parameter	Result(s)	Biological Reference Interval (Adult)
Thyroid Panel		
Free T4 (Direct) CLIA	0.9 ng/dL	0.78 – 2.19 (CLIA)
S. TSH (CLIA)	15.96 microIU/mL	Adults (>=22 years) (CLIA) Males & Females (non pregnant) : 0.4051 – 4.049 Adolescents (13 – 21 years) : 0.4357 – 4.160

Therapy, if any: On Ayurvedic Therapy
Test Note

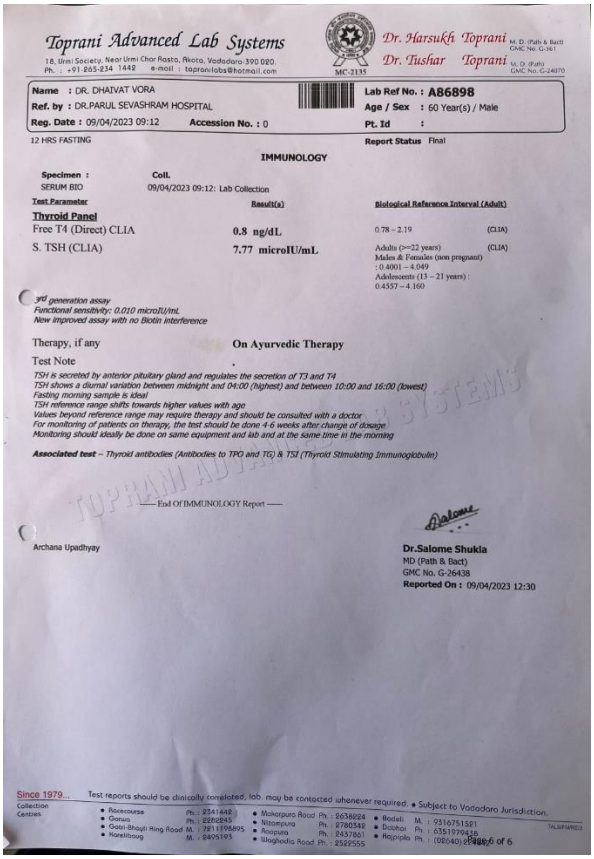
Associated test – Thyroid antibodies (Antibodies to TPO and TG) & TSI (Thyroid Stimulating Immunoglobulin)

---- End Of IMMUNOLOGY Report ----

Mubina

Dr. Tushar Toprani
MD (Path)
GMC No. G-24070
Reported On : 10/03/2023 12:32

Test reports should be clinically correlated, lab. may be contacted whenever required. • Subject to Vadodara Jurisdiction



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MC-2135
Dr. Harsukh Toprani M. D. (Path & Bact) GMC No. G-1961
Dr. Tushar Toprani M. D. (Path) GMC No. G-24870

Name : DR. DHAIVAT VORA
Ref. by : DR.PARUL SEVASHRAM HOSPITAL
Reg. Date : 09/04/2023 09:12 Accession No. : 0
Lab Ref No. : A86898
Age / Sex : 60 Year(s) / Male
Pt. Id :
12 HRS FASTING
Report Status Final

IMMUNOLOGY

Specimen : SERUM BIO
Coll. 09/04/2023 09:12: Lab Collection

Test Parameter	Result(s)	Biological Reference Interval (Adult)
Thyroid Panel		
Free T4 (Direct) CLIA	0.8 ng/dL	0.78 – 2.19 (CLIA)
S. TSH (CLIA)	7.77 microIU/mL	Adults (>=22 years) (CLIA) Males & Females (non pregnant) : 0.4001 – 4.049 Adolescents (13 – 21 years) : 0.4557 – 4.160

3rd generation assay
Functional sensitivity: 0.010 microIU/mL
New improved assay with no Biotin interference

Therapy, if any On Ayurvedic Therapy

Test Note
TSH is secreted by anterior pituitary gland and regulates the secretion of T3 and T4
TSH shows a diurnal variation between midnight and 04:00 (highest) and between 10:00 and 16:00 (lowest)
Fasting morning sample is ideal
TSH reference range shifts towards higher values with age
Values beyond reference range may require therapy and should be consulted with a doctor
For monitoring of patients on therapy, the test should be done 4-6 weeks after change of dosage
Monitoring should ideally be done on same equipment and lab and at the same time in the morning

Associated test – Thyroid antibodies (Antibodies to TPO and TG) & TSI (Thyroid Stimulating Immunoglobulin)

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End Of IMMUNOLOGY Report

Archana Upadhyay

Dr.Salome Shukla
MD (Path & Bact)
GMC No. G-26438
Reported On : 09/04/2023 12:30

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