HYPOTHYROIDISM AND HYPERTHYROIDISM IN WOMEN POPULATION OF INDORE (M.P.), INDIA

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Abstract: Thyroid is an endocrine gland that makes thyroid hormones: Thyroxine (T4) and Triiodothyronine (T4). These hormones control metabolic activity of human body. Disease of thyroid cause it to make either too much or too less of the T3 and T4. Women are more likely than men to have thyroid diseases, especially after menopause. In the study I report the case of thyroid disorders (hyperthyroidism and hypothyroidism) in woman with ages ranging 20-80yrs. in different areas of Indore, M.P.,India. All the female participants (n=625) were asked to complete questionnaire that include thyroid related questions. Total 15.68% participants were found to have thyroid disorders. Out of which 14.56 % of the female patients were found to have hypothyroidism, having TSH level more than 5.5 µIU/ ml and 1.12 % were having hyperthyroidism having TSH level less than 0.3 µIU/ ml.

Key words: hypothyroidism, hyperthyroidism, thyroxine, triiodothyronine, thyroid stimulating hormone.

Introduction: Thyroid abnormalities in human are a general health problem. The thyroid is the part of endocrine system, which is made up of glands located in front of the neck. The thyroid gland uses iodine from the food we eat to produce and release thyroid hormones: thyroxine (T_4) and triiodothyronine (T_3) into the blood stream, so the hormones can reach the body's cells. Every cell in the body depends upon thyroid hormones for regulation of their metabolism. When the level of thyroid hormones (T_3 & T_4) drops too low, the pituitary gland produces thyroid stimulating hormone (TSH) which stimulates the thyroid gland to produce more hormones (T_3 & T_4) Fig: 1 and 2.

The thyroid hormones regulate vital body functions, including breathing, heart rate, central and peripheral nervous system, body weight, muscle strength, menstrual cycles, body temperature, cholesterol level and much more (Horn, 1968).

Too much secretion of hormones causes the thyroid abnormality called: Hyperthyroidism. Symptoms are anxiety, moodiness, nervousness, hyperactivity, sweating, hand trembling, hair loss and light menstrual periods. Where as too little secretion of hormone in the body causes Hyperthyroidism. The symptoms are trouble sleeping, tiredness, difficulty concentrating, dry skin and hair, depression, sensitivity to cold temperature, heavy period & joint and muscle pain.

Thyroid disorder mainly hypothyroidism is significantly more common in women particularly those over age 50 yrs. (American Thyroid Association, 2009).

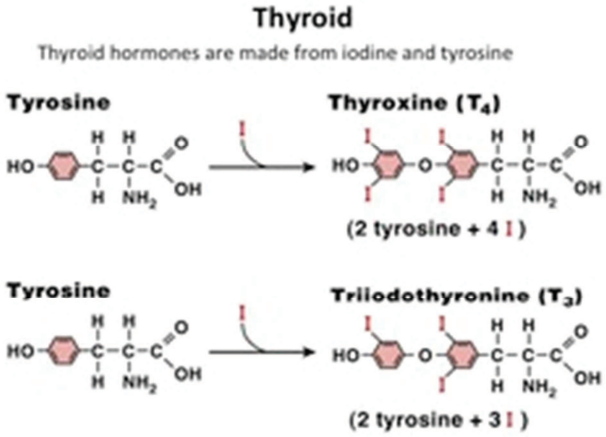
In this paper I report the cases of thyroid disorders in women in different localities of Indore, M.P., India. .

2. Material and Methods:

Survey was carried out on 625 women patients in different localities of Indore, M.P., India. All the female participants were asked to complete a questionnaire that includes thyroid related questions. Clinical pathological test report and values of TSH, T_3 & T_4 were also carried out for analysis.

The following are commonly used thyroid tests: "T_3 & T_4 testing by Competitive Chemi Luminescent Immuno Assay (C.C.L.I.) and TSH by Ultra Sensitive Sandwich Chemi Luminescent Immuno Assay" used by pathology labs.

Fig. 1: Showing biochemical formula of T3 and T4



3. Results: The total number of females included in the study was 625 (n = 625) with age ranging between 20 yrs. - 80 yrs. Total 15.68% female were found to have thyroid disorders. Out of which 14.56% of the female patients are found to have hypothyroidism having TSH level more than 5.5 µIU/ ml and 1.12% were having hyperthyroidism having TSH level less than 0.3 µIU/ ml. Table 1 shows normal values of T3, T4 and TSH.

In the age group 20-40 yrs., 2.08% female were suffering from hypothyroidism. No case of hyperthyroidism was found in this age group.

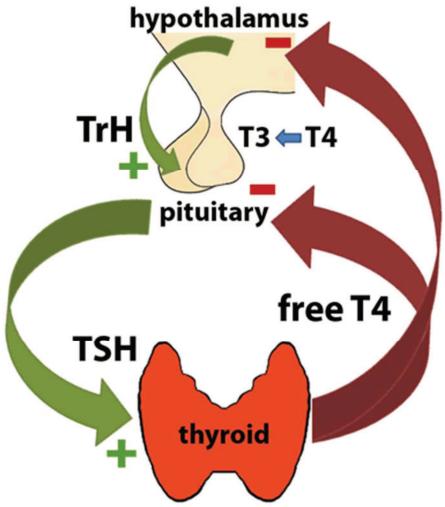


Fig. 2 The hypothalamus releases thyrotropin releasing hormone (TRH), which travels via a venous plexus to the anterior lobe of the pituitary gland and stimulates release of thyroid stimulating hormone (TSH). TSH then induces production of thyroxine (T_4) by the thyroid in response to the concentration of free T_4, which influences the amount of triiodothyonine (T_3) produced in each side both the hypothalamus and the pituitary alter production of (TRH), while low free T_4 stimulates production.

Within the age group 40 - 60 yrs., 5.6% female having hypothyroidism and 0.32% having hyperthyroidism. Where as age ranging between 60-80 yrs. and above, 6.88% and 0.80% cases of hypothyroidism and hyperthyroidism were observed respectively (Table 2).

Table No. 1 Normal Range of Thyroid Function Testing (According to American Association of Clinical Endocrinology):

Hormone	Normal Range	Hypo-thyroidism	Hyper-thyoidism
T_3	0.8 - 1.9 ng/ml	↓	↑
T_4	4.2 - 12.00 µg / dl	↓	↑
TSH	0.3 - 5.5 µIU / ml	↑	↓

Value, T_3 < .8 = Hypothyroidism ; T_3 > 1.9ng/ml Hyperthyroidism

T_4 < 4.2=Hypothyroidism ; T_4 > 12.00 µg/dl Hyperthyroidism

TSH>5.5=Hypothyroidism; TSH < .3 µIU/ml Hyperthyroidism

Table No. 2 Estimated Number and Percentage of Hyperthyroidism and Hypothyroidism:

Age Group in yrs.	Hypothyroidism ↑ TSH > 4.5 µIU/ml		Hyperthyroidism TSH ↓ < 0.4 µIU/ml	
	n	%	n	%
20-40	13	2.08%	-	-
40-60	35	5.6%	2	0.32%
60-80	43	6.88%	5	0.80%

However, 72% females reported current or former thyroxine medication. 0.6 % women gave a history of thyroid disease.

In the study T_4 values were found in lower normal range and there was no difference in T_4 with age in the survey. The percentage of women with high TSH > 4.5 IU/ml) was found in the age group 60-80 yrs.

Discussion: In the present study TSH concentration increased with age. The highest concentration was found in the older female population than younger population. This is very similar to the Master Health Checkups-

survey of Upadhaya (2012) in Bangalore. Abraham et. al. (2009) also reported similar trend of TSH increase with age in Puducherry, India.

Unnikrishnan et.al. (2013) revealed in his research that one in ten adults in India suffers from hypothyroidism, with 50% being women. Women were three times more likely to be affected by thyroid disorders especially those in the age group 45-65 yrs..

The reason for this is still unknown; we will need more nation wide studies to identify why women are more prone to thyroid diseases via men. According to Dr. Mahesh Padsalge (Consultant Diabetologist) one of the reasons can be ignorance', and patients were not aware of the conditions,

Our results demonstrate that thyroid dysfunction may develop gradually with the age. The values of T4 in the study correspond well to Bauer & Brown (1996) reported in their study.

The negative correlation between TSH and T4 was observed in the study as reported by Bjora et. al. (2000) in their study.

Treatment: Hypothyroidism is caused by the thyroid's ability to produce hormones. The biggest problem with hypothyroidism is that there are no preventive measures to fight it. The only solution is early screening of the diseases through a simple TSH (Thyroid Stimulating Hormone) test and dose adjustments. If left untreated, hypothyroidism can cause elevated cholesterol levels, an increase in blood pressure, increased rate of cardiovascular complications, decreased fertility, and depression; and in pregnant women, placental abnormalities and increased risks for the baby's well being. For hypothyroidism doctor prescribe a supplement /

synthetic (man made) thyroid hormone T_4. Whereas hyperthyroidism can be treated by anti thyroid medicine which block thyroid from making new thyroid hormone, or radioiodine which kills the thyroid cells that make thyroid hormones, or thyroid surgery removes most or all of the thyroid(Turner,1976).

The only treatment for thyroid disease, (whether hypothyroidism or hypothyroidism) is cleaning of the system and adoption of a rational diet thereafter, combined with adequate rest and relaxation. Iodine is most helpful in many cases, but it should be intruded in organic forms. Foods containing iodine should be taken liberally. These are asparagus, cabbage, garlic, onion, oats, pineapple, whole rice, tomatoes, and strawberries.

Conclusion: Thyroid disease is a nation wide reality. About 10% people in the India have some form of thyroid disease. Thyroid disorders can be due to genetic, environmental or dietary factors and are most commonly diagnosed between the ages of 40-50yrs. and above, but can occur at all ages. Further thyroid research is necessary to continue the progress that has been made in diagnosis and treatment. Although there are effective treatments for most thyroid disorders, the under lying causes require further investigation. The continued study of the thyroid may yield important knowledge in other areas of medical and biological sciences.

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References:

1. Thyroid disorders in information medicine Net (2010).
2. Abraham, R., Murugan, V., Pukazh-vanthen, P. and Sen. S.K. (2009): "Thyroid Disorders in Women of Puducherry". *Indian Journal of Clinical Biochemistry*, 24 (1) 52-59.
3. Upadhaya, M. (2012): "Importance of Inclusion of Thyroid Stimulating Hormone (TSH) Test in Master Health Checkups Survey". *International Journal of Pharmacy and Biological Science.* Vol. 2 (3): 216-222.
4. Bjoro, T., Holmen, J., Kruger, Q., Midthjell, K., Hunstad, K., Schreiner, T., et. al. (2000): "Prevalence of thyroid disease, thyroid dysfunction and thyroid peroxidase antibodies in a large unselected population". The Health Study of Nord-Trondelag (HUNT). *Euro J Endocrinol*; 143:639-47.
5. Bauer, D. & Brown, M. (1996): "Sensitive thyrotropin and free thyroxine testing in outpatients". 156: 2333-2337.
6. American Thyroid Association (2014). "Prevalence and Impact of Thyroid Disease".
7. Horn, E.H., (1968), "Endocrinology".66-129.
8. Turner, C.D., Bangara, S. T., (1976): "General Endocrinology". McGram Hills, New York: 599-615.
9. Unnikrishnan, A. G. (2013): "Prevalence of hypothyroidism in adults". *Indian Journal of Endocrinology and Metabolism*. 17:642-52.

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