



## **HYPOTHYROIDISM OCCURS DUE TO IODINE DEFICIENCY, THE HORMONAL ASSAY T<sub>3</sub>, T<sub>4</sub> AND TSH DONE BY ELISA TEST IN UJJAIN DISTRICT MP INDIA**

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### **ABSTRACT**

Hypothyroidism is a 'Public health problem occurs due to Iodine deficiency and it is mostly described in Human population; significantly it is more common in female, than males. Interpretation of the TSH level depends upon the level of thyroid hormone; T<sub>3</sub>, T<sub>4</sub> and TSH, low value of T<sub>3</sub>, T<sub>4</sub> and high value of TSH defines thyroid disorders; Hypothyroidism and its vice-versa condition is Hyperthyroidism, the hormonal assay done by ELISA (Enzyme Link Immunosorbent Assay) test.

#### **Keywords:**

*Hypothyroidism, T<sub>3</sub> (Triiodothyronine), T<sub>4</sub> (Thyroxine) and (Thyroid stimulating hormone), ELISA (Enzyme Link Immunosorbent Assay).*

### **INTRODUCTION**

In the present investigation, data were selected from exclusive "Thyrocare hospitals R.D. Gardi medical college, CHL Apollo, and J.K. Nursing Home Ujjain MP India, during 2011-2013 years. In present study 18600 patients studied, 6675 patient were affected by Hypothyroidism.

Hypothyroidism occurs due to Iodine deficiency, Iodine rich diet includes:- fish oil, fast food-poha, chocolates, banana, milk, eggs, etc and other vitamin E rich compounds, which stimulate Iodine absorption such as Soya bin oil, Alfa-Alfa, Groundnut and oil, Germinating seeds etc. (Japan FDAS total diet study, 1982-1984).

Hypothyroidism is a condition in which the body lacks sufficient thyroid hormone, associated with and increased risk of slow metabolism and cardiovascular disease and (a) Cretinism (b) Myxoedema (c) Simple goiter (d) Hashimoto's disease (Autoimmune disease).

Symptoms are Fatigue, Weakness, Weight gain, Coarse dry hair, Dry rough pale skin, Hair loss, Cold intolerance, Muscle aches, Constipation, Irritability, Memory loss, Abnormal menstrual cycles, etc.

### **ABNORMALITIES RELATED TO HYPOTHYROIDISM**

**Goiter:-** Any enlargement of the Thyroid Gland is called Goiter and antithyroid substance that causes Thyroid enlargement are called Goitrogens Fig.-1

**Cretinism:-** It is caused due to congenital absence or mal development of Thyroid in Infant symptoms are short status with deformed teeth and bones. Abnormal viscera are relatively large resembling pot and belly appearance.

**Myxoedema:-** Hypothyroidism in adult Human being produces Myxoedema or Gulls disease. It shows following symptoms-the face becomes swelling, BMR lowered by 30-45%, mental dullness, loss of memory, Hair tend to fall and appetite is reduced etc.

**Hashimoto's disease:-** Hashimoto's disease is an Autoimmune disease in which the thyroid gland is gradually destroyed by a variety of cell and antibody mediated immune processes. It was the first described by the Japanese expert Dr. Hashimoto Hakaru in Germany in 1912.

### **NUTRITIONAL STATUS**

Nutritional status include following food material, which helpful for the thyroid functions are: carrot, spinach, apricots (yellow orange), asparagus, olive oil, avocado, sunflower seeds, whole cereals grain, bananas, oily fish, etc (food and drugs administrations (FAD's) total diet study-1982-1984 Japan). Iodine contains food: sea weeds, fish oil, poha, chocolates, banana, milk, eggs etc and vitamin E rich food: soya bin oil, alfa-alfa, groundnut oil, germinating seeds etc, stimulate iodine absorption, the daily requirement of iodine is 100-150 µg in Human.

### **MATERIAL AND METHOD**

In the present study hormonal estimation done by ELISA test, it can determinate mildest cases of Hypothyroidism.

ELISA is a simple and highly sensitive method of analysis that allows for simultaneous and rapid quantification of a large no. of sample. "Enzyme Immunosorbent assay" for the quantitative determination of Thyroid hormone (T<sub>3</sub> and T<sub>4</sub>) and pituitary hormone (TSH) concentration in human serum/plasma, is done by ELISA KIT. This micro plate enzyme immunoassay methodology provides the technician with optimum sensitivity while requiring few technical manipulations.

#### **Normal value**

<b>T<sub>3</sub></b>	<b>0.52-1.85 ng/ml</b>
<b>T<sub>4</sub></b>	
Male	<b>4.4 -10.8 µg/dl</b>
Female	<b>4.8-11.6 µg/dl</b>
<b>TSH</b>	
Low range	<b>0.49-5.5 µIU/ml</b>
High range	<b>6.16 µIU/ml</b>

### **RESULT & DISCUSSION**

The study has been done on 6675 patients and their age was between 1 to 80 Years. A total of 4630 Female and 2045 Males were studied. Information was collected about age groups, sex, hormonal assay (T<sub>4</sub>, T<sub>3</sub> and TSH), genetic defected, Socio-economic profile, magnitude of thyroid disorders and female Vs male significant level.

Iodine is found in water and vegetable trace amount. Severe Iodine Deficiency result in impaired:- Thyroid hormones synthesis and thyroid enlargement leads to goitre, iodine deficiency disorder (IDDs) include:- a) endemic goitre b) Hypothyroidism c) cretinism d) decreased fertility rate e) increased infant mortality g) mental retardation. To protect from thyroid deficiency we should consume iodized salt in micro quantity daily, and Indian govt there for made compulsory iodized salt for human population.

Recent estimation in Ujjain, the prevalence of Thyroid disorders is approximately 69.35% in Females and 30.63% in Males thyroid patients. Data clearly show that hypothyroidism is highly

significant in age groups: 21-30, 31-40, and 41-50 and significant level [ $P \geq 0.001$ ] is greater in female than in male thyroid patients (Skugor M, *et. al.* 2009). Fig. -2

## CONCLUSION

Epidemiological study carried out in Ujjain district, show that Hypothyroidism still remains one of the serious health problems, due to iodine deficiency and growing fast in India, for so many reasons. Hypothyroidism is significantly more common in female than in male, in different age groups and statically highly significant level is  $P \geq 0.001$ .

The present reports provide important data to the Government and other agencies to control this problem in India and also launch some special programs to prevent Hypothyroidism. This work also helps the Clinician to diagnose the mildest cases of Hypothyroidism among Hospitals patient by Enzyme Link Immunosorbent Assay (ELISA) technique.

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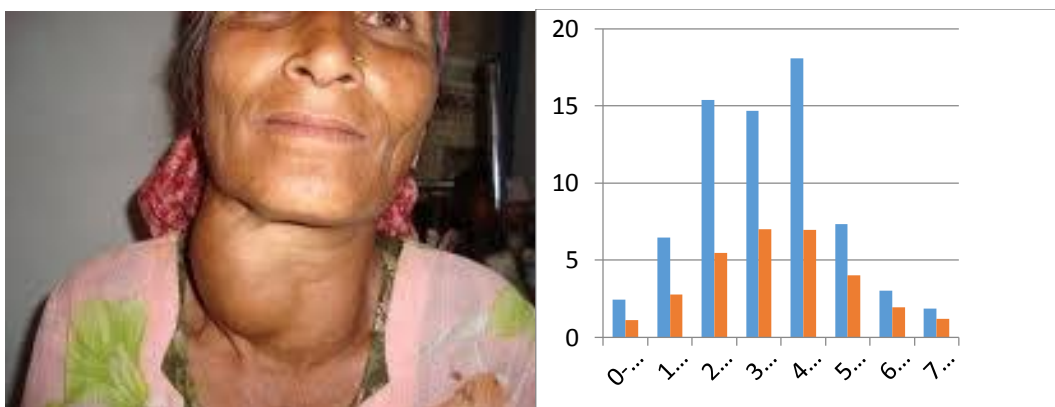


Fig.-1 shows Goiter in hypothyroid patient in Ujjain district hospital.

Fig.-2 shows comparative data between female & male thyroid patients in different age groups