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### RESEARCH ARTICLE

#### THYROID DISORDERS AMONG PATIENTS VISITING TERTIARY HEALTH CARE CENTRE IN EASTERN UTTAR PRADESH.

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#### Abstract

**Background:** Thyroid hormone abnormalities are the commonest endocrine disorder in India, but there is scarcity of data on the status of thyroid disorders in this part of eastern Uttar Pradesh of India.

**Objective:** To determine the prevalence, clinical profile and associated co-morbidities of thyroid disorders in Prayagraj and nearby areas.

**Methods and Materials:** A hospital based, cross sectional study was conducted at MLN Medical College and Swaroop Rani Nehru Hospital, Prayagraj. Patients visiting the medicine out-patient department (OPD) and in-patient department (IPD) were included if they had clinical suspicion of thyroid dysfunction. Clinical features of the 783 recruited patients were noted. Thyroid profile consisting of Tri-iodothyronin (T3), Thyroxin (T4) and Thyroid stimulating hormone (TSH) levels were tested in all. Investigations were also carried out to look for the co-morbidities associated with hypothyroidism.

**Results:** Out of the 783 patients tested, 626 were females and 157 were males. 190 patients were found to have thyroid function abnormalities, 29 having subclinical hypothyroidism, 145 were overt hypothyroidism and 16 having hyperthyroidism. There was a high prevalence of goitre (43.75%) among patients of hyperthyroidism. The clinical feature of patients with hypo and hyperthyroidism was similar to other reported studies. Fatigue (70.38%) being the most common symptom in patients of overt hypothyroidism while palpitation (75%) was the most common presentation in patients of hyperthyroidism. A host of co-morbidities was observed along with thyroid dysfunction; anemia (n=47) was the most common followed by type 2 diabetes mellitus (n=33).

**Conclusion:** Higher prevalence of hypothyroidism was observed in patients (especially females) in their third to fourth decade of life. Goiter is more frequent finding in patients of hyperthyroidism. The findings also support the indication of thyroid hormone screening during third decade of life and afterwards.

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#### Introduction:-

Diseases of the thyroid gland are among the most abundant endocrine disorders worldwide second only to diabetes. The burden of thyroid disease in the general population is enormous. Thyroid disorders are the most common among

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all the endocrine diseases in India.[1] Recent report shows that 300 million people in the world are suffering from thyroid disorders and among them about 42 million people reside in India.[2] In studies from western literature as many as 50% of people in the community have microscopic nodules, 15% have palpable goitres, 10% demonstrate an abnormal thyroid-stimulating hormone level, and 5% of women have overt hypothyroidism or hyperthyroidism.[3] Thyroid hormones perform a wide range of functions including regulation of lipids, carbohydrates, and proteins metabolism.[4] Their dysfunction manifests in a wide spectrum of clinical diseases either as hypo or hyper functioning of the thyroid gland reflected in the circulating levels of Tri-iodothyronin (T3), Thyroxin (T4) and Thyroid stimulating hormone (TSH) and biochemical abnormalities.

Thyroid diseases are different from other diseases in terms of their ease of diagnosis, accessibility of medical treatment, and the relative visibility that even a small swelling of the thyroid offers to the treating physician. Early diagnosis and treatment remain the cornerstone of management. The disorders of thyroid hormone can be due to diseases of the thyroid gland itself (primary), secondary to pituitary disorder (secondary) or due to hypothalamic diseases (tertiary). The prevalence of thyroid dysfunction depends on gender, age, ethnic and geographical background and most importantly on iodine intake.

Therefore, data of thyroid disorders from one population cannot be extrapolated to other. Despite the successful implementation and widespread coverage of National Iodine Deficiency Diseases Control Program (NIDDCP) in India, thyroid disorders are still prevalent in many parts of the country [5]. Highlighting the lack of attention paid to thyroid disorders, Thyroid Research and Practice advocated inclusion of thyroid diseases in the list of non-communicable disease of public health importance [6].

This cross-sectional study was carried out to determine the prevalence, clinical profile and associated co-morbidities of thyroid dysfunction in patients visiting tertiary care health centre of eastern part of Uttar Pradesh, India.

### **Materials and Methods:-**

This study was conducted in the Department of General Medicine in Motilal Nehru Medical College and Swaroop Rani Nehru hospital, Prayagraj. The study was carried out over a period of 10 months (April 2018- January 2019). Patients who visited the medicine Out-Patient Department (OPD) and in-patient department (IPD) were included if they had clinical suspicion of thyroid dysfunction. Ethical clearance was obtained from the Institute Ethics Committee and a written informed consent was taken from either of the parents/ legal guardian.

Patients who were on any medications known to alter the thyroid hormone status including patients already diagnosed with thyroid disorder on therapy and patient in whom an informed consent could not be obtained were excluded from the study. Total of 783 patients were selected for the study. After an overnight fasting, 3 ml venous blood samples were collected in the morning. Blood was allowed to clot and centrifuged at 2500 rpm for 15 min at room temperature. The serum was then assayed for T3, T4, and TSH by enzyme linked fluorescent assay (ELFA) technique using Vidas auto-analyzer.

The reference range for T3, T4, and TSH for our laboratory was as follows:

T3: 1.23–3.23 nmol/L  
T4: 59–135 nmol/L  
TSH: 0.4–4.2 mIU/L

The study cohort were categorized into four groups. Those having normal T3, T4, and TSH levels were categorized into the euthyroid group; patients having normal T3, T4, and high TSH were in the subclinical hypothyroid group; patients having low T3, T4, and high TSH were in the overt hypothyroid group and those having a high level of T3 and T4 and lower TSH levels were regarded as hyperthyroid group. Each of these groups was further divided in five age groups to determine the occurrence of various thyroid disorders in different age groups.

### **Results:-**

Out of the 783 patients tested, 626 were females and 157 were males. The ratio of female to male in our study was 3.98:1. Out of 783 selected patients 593 were euthyroid. The rest of 190 patients having thyroid disorder were classified according to their thyroid status as subclinical hypothyroidism, overt hypothyroidism, hyperthyroidism, shown in Table I. A higher prevalence of thyroid disorder was seen in patients who are in their third to fourth decade

of life with a female preponderance. A higher prevalence of hyperthyroidism in the age group of 40-49 years while hypothyroidism was seen more in patients in the age group of 30-39 years. A prevalence of subclinical hypothyroidism of around 3.7% (n=29;F=26,M=3), hypothyroidism of around 19.67% (n=154; F=145, M=9) and hyperthyroidism of around 2.04% (n=16; F=12, M=4) was noted. The study revealed that women are at more risk to suffer from hypothyroidism.

**Table –I** Distribution of thyroid disorder in age groups

Age group/disorder	Subclinical hypothyroidism (n=29)	Overt hypothyroidism (n=145)	Hyperthyroidism (n=16)
10-19 yrs	2	11	1
20-29 yrs	6	25	2
30-39 yrs	10	45	3
40-49 yrs	9	43	8
>49 yrs	2	30	2

Clinical Presentations of thyroid disorders among study patients are listed in table-II and table-III in decreasing order-

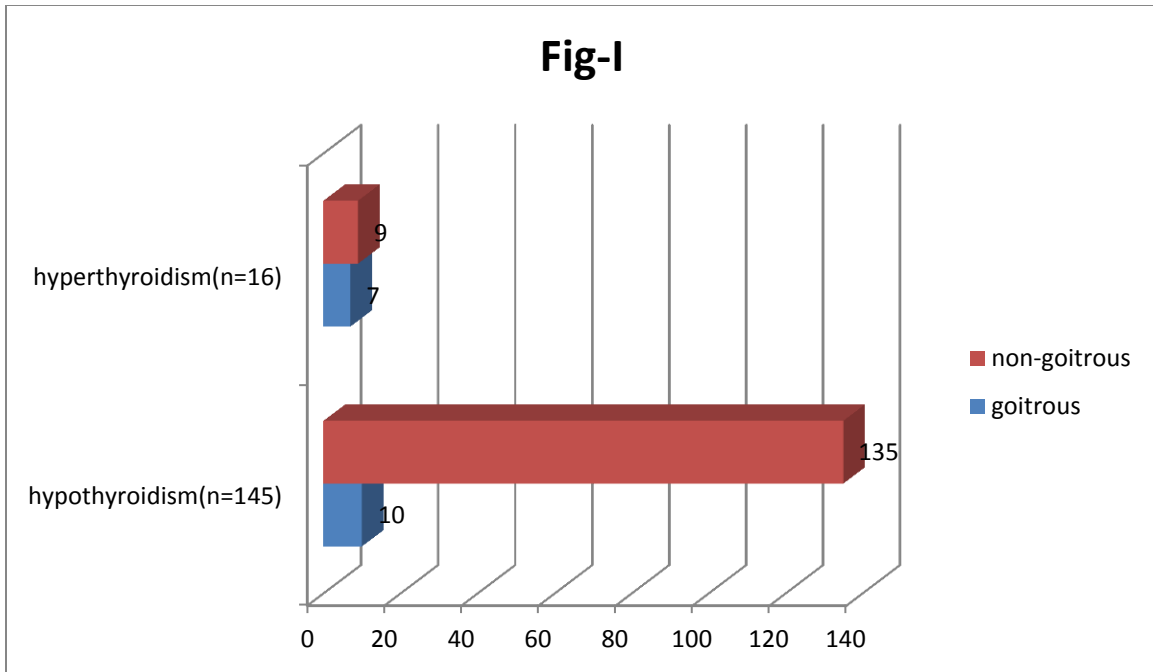
**Table-2** Clinical presentation of hypothyroidism at baseline Overall (n=145), n (%)

<b>Symptoms</b>	
Fatigue	102 (70.38%)
Weight gain with poor appetite	73 (50.34%)
Poor memory and concentration	43 (29.65%)
Constipation	36 (24.82%)
Shortness of breath	27 (18.62%)
Feeling cold	26 (17.93%)
Periorbital edema/puffiness below eyes	23 (15.86%)
Irregular menstruation	19 (13.1%)
Hoarseness of voice	16 (11.03%)
<b>Signs</b>	
Hair loss	51 (35.17%)
Dry, coarse skin	43 (29.65%)
Swelling of limbs	37 (25.51%)
Cool extremities	11 (7.58%)
Slow pulse rate	7 (4.83%)
Carpel tunnel syndrome	4 (2.75%)

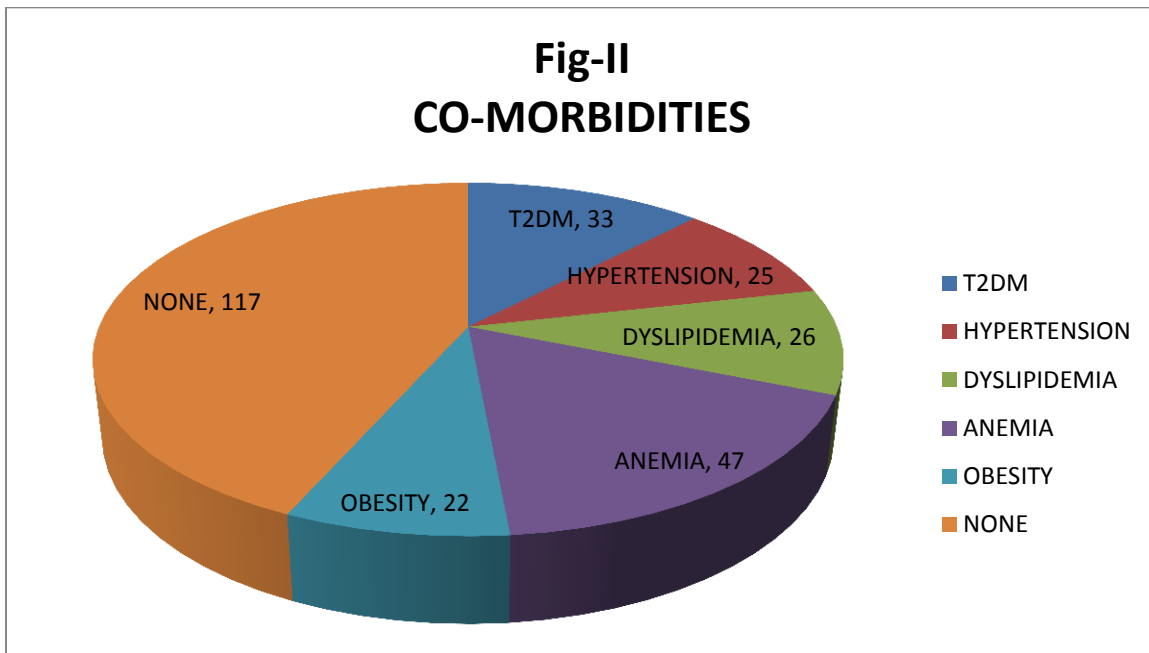
**Table-III** Clinical presentation of hyperthyroidism at baseline Overall (n=16), n (%)

<b>Symptoms</b>	
Palpitation	12 (75%)
Increased frequency of stools	7(43.75%)
Heat intolerance	7 (43.75%)
Weight loss	6 (37.5%)
Fatigue	4 (25%)
<b>Signs</b>	
Tachycardia	16 (100%)
Tremor	13 (81.25%)
Goiter	7 (43.75%)
Moist skin	7 (43.75%)
Ophthalmopathy	2 (12.5%)

Overall, only 8.94 % of patients (17 out of 190) with thyroid dysfunction had goitre but it was associated with 43.75 % cases of hyperthyroidism (7 out of 16) (Fig-I).



Various Co-Morbid Conditions Associated with Thyroid Disorders among patients are depicted in fig-II



**Discussion:-**

The burden of thyroid disease in the general population is enormous. Thyroid disorders are the most common among all the endocrine diseases in India. However there is no data on the status of thyroid disorders in eastern part of Uttar Pradesh. This cross sectional hospital based study was carried out involving 783 subjects with suspicion of thyroid disorder who were subjected to thyroid function assay.

In this study, we found that thyroid dysfunction prevalence was higher among the female population. A high prevalence of thyroid disorders was observed in the age group of 30-49 years and the women are more likely to suffer from thyroid disorders which is in accordance with study conducted in Meerut, Uttar Pradesh by Ahmad et al.

which shows a higher prevalence of thyroid hormone level abnormalities and TSH within the patients who are in their third decades of life.[7] Another population-based study carried out in Cochin on 971 adult subjects, the prevalence of hypothyroidism was more. [8] The prevalence of subclinical hypothyroidism increased with age. About 53% of subjects with subclinical hypothyroidism were positive for anti-TPO antibodies in this study while in our population study in patients of subclinical hypothyroidism, 34.5% patients were positive for anti-TPO antibodies.

In an epidemiological study from Cochin, hyperthyroidism was present in 1.3% of subjects participating in a community survey.[8] In a hospital-based study of women from Pondicherry, subclinical and overt hyperthyroidism were present in 0.6% and 1.2% of subjects.[9] More than a third of community-detected hyperthyroid cases have positive anti-TPO antibodies, and about 39% of these subjects have a goiter. [9]

Studies have suggested a decline in the prevalence of goiter in India post the universal salt iodization program in 1983. [10] In our study, we found the prevalence of goiter in about 8.94% patients, a noteworthy finding.

### **Conclusion:-**

This attempt is made to determine the prevalence of thyroid diseases in the study area from the limited available data and sources. Our study suggested that the prevalence of thyroid disorders in our study population is high and overt hypothyroidism is more common than subclinical hypothyroidism followed by hyperthyroidism. Highest prevalence of thyroid disorder was found in 30-49 years age group. We found high female preponderance of the thyroid disorders. We believe that this bias was introduced in the study since more number of females were subjected to thyroid function test as a part of routine protocol. However, only those males with suspicion of thyroid disorders were subjected to TFT. The finding that a large number of subjects unknowingly have laboratory evidence of thyroid dysfunction supports the usefulness of screening of thyroid function after age of 30 years, for early detection and treatment to reduce the ill effects of thyroid dysfunction.

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