



Hypothyroidism and its Associations- An Observational Study in North India

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Abstract

Hypothyroidism has broad clinical with high prevalence in Indian population. Hypothyroidism has been associated with many co morbid clinical conditions. Current Study conducted as retrospective study using data of newly diagnosed hypothyroid patients collected from outpatient department of Medicine. Study results showed that Female patients were in higher number than males. A total of 46% patients were overweight and 33.3% patients were obese. 58% patients presented with fatigue which was the commonest symptom among patients. Thyroid swelling was observed in 40% of participants. Menstrual abnormalities were reported by 80% female participants. Female participants had lower mean systolic blood pressure than male participants. Overall TSH level among all patients was 24.6 ± 32.5 mIU/L. Subclinical hypothyroidism was found in 16% patients. Female patients had higher mean TSH as compared to males. 10.6 % of patients were diagnosed to be suffering with Diabetes Mellitus. The current Study concludes that Hypothyroid patients should be evaluated for other co morbid associations for better patient management and outcome.

Introduction

Hypothyroidism is a broad clinical spectrum ranging from an overt myxoedema to an asymptomatic or subclinical condition with normal levels. The prevalence of hypothyroidism in the developed world is about 4-5%. The prevalence of subclinical hypothyroidism in the developed world is about 4-15%.^{[1],[2]} Projection from various studies suggest that approximately 42 million people in

India suffer from thyroid diseases.^[3] Prevalence of hypothyroidism in the overall Indian study population was 10.95%.^[4] Females were significantly higher in proportion than males.^[4] Hypothyroidism contributes to cardiovascular morbidity by enhancing other risk factors like hyperlipidemia and hypertension.^[5] Hypothyroidism has also been associated with nonalcoholic fatty liver disease, cancer mortality, arthritis, and kidney dysfunction but the casualty in these situations is

controversial.^[6] Looking at hypothyroidism as one of the prevalent clinical condition, its proven effects on pathophysiology of other disorders, its associations need to be evaluated. Present study aims to find epidemiology of hypothyroidism and its associations in north Indian state, Utter Pradesh.

Materials and Methods

Study was conducted in the Department of Medicine, G S Medical College & Hospital. Data of patients reporting in the Out Patients Department of Medicine were included in the study. Newly diagnosed patients and treatment naive with both clinical and subclinical hypothyroidism were included. Patients associated with Pregnancy, Chronic Liver or Kidney disease, on drugs affecting thyroid physiology and post thyroid surgery or ablation was excluded. Study was retrospective, observational cross sectional with sample size of 150 patients and study period of 4 months. Data was collected retrospectively from outpatient department of medicine. Statistical analysis was done by appropriate statistical test with the help of SPSS software 23 version.

Results

Data of 150 newly diagnosed patients with hypothyroidism was collected from the outpatient department. Their clinical reports and required parameters were noted and analysis was done.

Sex Distribution:

Out of total 150 patients, 107 (71.3%) patients were females and 43 (28.7%) were males. Overall mean age of all patients was 33.02 with SD ±14.39 years. Mean age of females was less as compared to males.

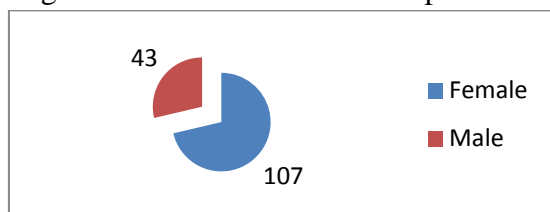


Figure 1 Sex distribution

BMI

Mean calculated BMI of participants was 25.9 ±6.1 kg/m². Gender analysis of BMI revealed that males had slightly higher mean BMI 24.6±3.6 as compared to females who had mean BMI of 24.4±4.4 kg/m². A total of 69 (46%) patients were overweight and 50 (33.3%) patients were obese. Cut-offs for overweight (BMI ≥23.0kg/m²) and obesity (BMI ≥25.0kg/m²) were taken.^[7]

Symptoms

87 (58%) patients presented with fatigue which was the commonest symptom among patients. Menstrual abnormalities were reported by 86 (80%) female participants and amongst menstrual abnormalities, menorrhagia (72%) was the most common symptom followed by irregular menstrual cycle. No post menopausal women reported abnormal vaginal bleeding. Thyroid swelling was observed in 40% of participants while 18 (12%) had complaint of constipation and 10 (6.6%) of patients had Hoarseness of voice.

Table 1 Presenting Symptoms

Symptom	Patient %
Fatigue	87%
Weight gain	56%
Irregular menstruation	57.30%
Thyroid swelling	40%
Constipation	18%
Feeling cold	22%
Hoarseness of voice	12%

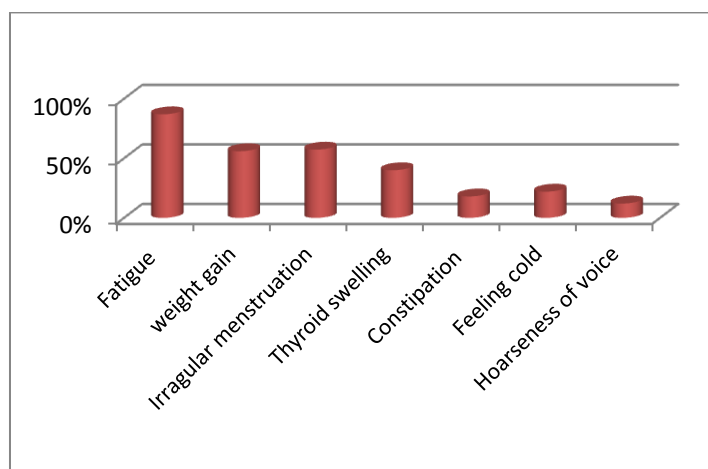


Figure 2 - Presenting Symptoms

Blood pressure

Mean systolic blood pressure recorded amongst participants was 125.9 ± 15.3 mmHg. Gender analysis of systolic blood pressure revealed that the female participants had mean systolic blood pressure of 123.5 ± 12.4 mmHg while the male participants had mean systolic blood pressure of 131.9 ± 19.5 mmHg.

Participants of ≥ 40 year age had mean SBP of 138.36 ± 16.86 mmHg. Males above 40 years had mean SBP 149 ± 18.66 mmHg whereas females of the same age group had mean SBP 138.36 ± 16.86 mmHg, which is statistically significant with $p = 0.015$.

Mean diastolic pressure in all participants was 78.3 ± 10.6 mmHg. Mean diastolic pressure among males was 80 ± 12.2 mmHg whereas among females it was 77 ± 13.2 mmHg. Mean diastolic pressure among all patients above 40 years was 88.6 ± 11.6 mmHg.

Thyroid profile

Overall TSH level among all patients was 24.6 ± 32.5 mIU/L. Subclinical hypothyroidism was found in 16% patients. Female patients had higher mean TSH 28.19 ± 29.8 mIU/L as compared to males with mean TSH 22.6 ± 24.3 mIU/L, which is statistically insignificant with p value 0.328.

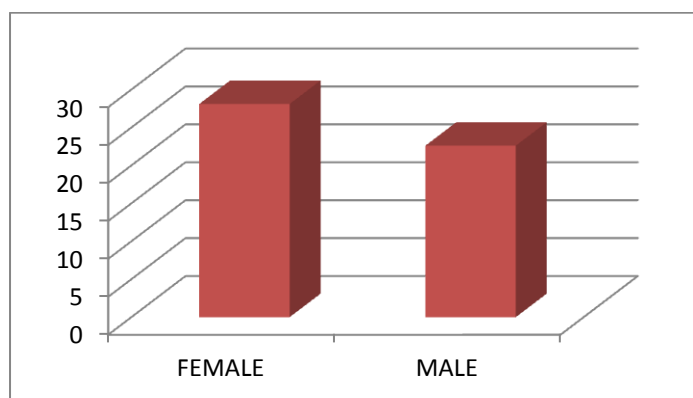


Figure 2 - TSH (mIU/L)

Diabetic profile

Mean fasting blood sugar of participants was 94.2 ± 12.1 mg%. 16 (10.6 %) of patients were diagnosed to be suffering from Diabetes Mellitus. All diagnosed diabetic patients were more than 35 years of age. 4 patients were on insulin therapy along with

oral hypoglycaemic drugs. Diabetes was found to be more prevalent in males than females (10 vs 6 patients). Glycosylated haemoglobin could be done in 10 patients and was found to be 9.4 in females and 9.7 among males which is statistically insignificant with p value 0.405.

On correlating the BMI and TSH value, weakly positive correlation found between two parameters with correlation coefficient 0.19 and p value 0.59.

Discussion

Hypothyroidism is one of the common endocrine disorders prevalent in population. Its ability to remain undiagnosed and its non specific symptoms give it a peculiar but important clinical entity. Prevalence of hypothyroidism in India, in earlier studies was found to be 10.05% in the general population.^[4] Study conducted by Usha Menon Vet al. in eight cities of India found 8.02% prevalence of subclinical hypothyroidism (SCH).^[8]

In our study we found that females were more affected than males in ratio of approximate 2.5:1, which is consistent with other epidemiological findings.^{[9],[10]} Current study also points towards lower mean age of females than affected males. Mean calculated BMI of participants was 25.9 ± 6.1 kg/m² with male participants having slightly higher BMI than Females which is statistically not significant with p value >0.05 . Overall 46% participants were overweight and approximately 33% participants were obese. Our Study also found weak positive correlation between BMI and TSH levels. Study by Xu, R.^[11] on Chinese population did not find correlation between TSH level and BMI but thyroid hormonal level (T3 and T4) and BMI were correlated in their study, conflicting to this Meng Z et al.^[12], [found TSH level to correlated to BMI.

Fatigue was found to be the most common symptom (58%) among study participants similar to study by Sethi B et al.^[13] on Indian population suggesting the metabolic effect of thyroid gland dysfunction. Similar finding was also found by Delemer et al.^[14]. This highlights the importance of this non specific symptom in terms of hypothyroidism.

Approximately 80% of females in the study group had menstrual cycle related complaints. These points to the relevance of thyroid status among females presenting with menstrual related complaints. Our study also found large number of clinical thyroid swelling (40%) among participants. Mean blood pressure of female participants was lower than males. On further analysis, participants expected over 40 year of age had significantly higher blood pressure. Males over 40 years had significantly higher blood pressure than females over 40 years with p value <0.05. No correlation was found between mean BP and TSH levels. Nair A et al in their study based in south India found average systolic and diastolic BP being 131 ± 18 and 77 ± 8.8 mm of Hg respectively and 58.2% persons had a systolic BP more than 130 mm of Hg, and 14.9 patients had a diastolic BP above 90 mm of Hg^[15]

Current study revealed mean fasting blood sugar of participants as 94.2 ± 12.1 mg% with Diabetes diagnosed in 10.6 % of patients and males more commonly affected. Studies have documented a higher than normal prevalence of thyroid dysfunction. 12.3% prevalence of thyroid dysfunction was reported among Greek diabetic patients^[16] and 16% of Saudi patients with type 2 diabetes were found to have thyroid dysfunction^[17]. Overall TSH level among all patients was 24.6 ± 32.5 . Subclinical hypothyroidism was found among 16% patients as compared to 9.4% found by Unnikrishnan AG et al in their study in India.^{8[4]} Females patients were found to having higher TSH level as compared to males but it was statistically not significant. In contrast to this, in Asian population, Mansoor R et al^[18] in her study concluded significantly higher TSH level among male population than female population amongst primary hypothyroid cases. Meng Z et al^[12]. On Chinese population found higher TSH level in females than male population.

Conclusion

Hypothyroidism remains an important clinical entity which may present with non specific

symptomatology and may remain undiagnosed in population. Subclinical hypothyroidism makes an important subgroup in this clinical spectrum. Its association with other co morbid clinical conditions and its role in pathophysiology of other diseases makes hypothyroidism important for early diagnosis and proper management

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