



A STUDY ON THE PREVALENCE OF HYPOTHYROIDISM IN OPD OF NATIONAL INSTITUTE OF UNANI MEDICINE, BENGALURU, INDIA

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ABSTRACT

Introduction: India is a developing country with a population of about 1.3 billion. Non communicable diseases contribute for around 60% of all fatalities in India. Thyroid disorders are among the most common endocrine disorders in clinical practice. Hypothyroidism is believed to be a common health issue in India, as it is worldwide. However, there is a paucity of data on the prevalence of hypothyroidism in adult population of India.

Methodology: The research design was an institution based, single centered, observational descriptive study, cross sectional in design and was carried out for a duration of 28 days (4 weeks) from 01.06.2024 to 29.06.2024. The study was conducted in the Outpatient Department (OPD) of Regimenal therapies, National Institute of Unani Medicine (NIUM), Bengaluru. Thyroid abnormalities were diagnosed on the basis of laboratory results (serum FT3, FT4 and Thyroid Stimulating Hormone [TSH]). Patients with history of hypothyroidism and receiving levothyroxine therapy or those with serum free T4 < 0.89 ng/dl and TSH > 5.50 µIU/ml, were categorized as hypothyroid. The prevalence of self reported and undetected hypothyroidism was assessed. Data analysis was done using SPSS version 24.

Results: A total of 550 adult male or non-pregnant female participants ≥ 21 years of age were enrolled, of which 524 (54% females and 46% males) were evaluated. The overall prevalence of hypothyroidism was 07% (n=37, 95% CI) of which 4% (n =21) patients self reported the condition, whereas 3% (n =16) were previously undetected. Additionally, 4% (n =21) patients were diagnosed to have subclinical hypothyroidism (normal serum free T4 and TSH > 5.50 µIU/ml). In the present study, 75.68% of diagnosed hypothyroid patients were females and rest 24.32% were males. Majority of diagnosed patients (32.43%) belonged to the age group of above 31-40 years.

Conclusion: The prevalence of hypothyroidism was high, affecting approximately one in 14 adults in the study population. Female gender and Diabetes were found to have significant association with hypothyroidism. Subclinical hypothyroidism was the other common observation.

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INTRODUCTION

Non communicable diseases cause long-term health consequences and often create a need for long-term treatment and care. They contribute to around 38 million (68%) of all the deaths globally and to about 5.87 million (60%) of all deaths in India¹. Thyroid dysfunction (TD) is a prevalent endocrine

condition that affects 200 million people (40 percent of the global population)². Hypothyroidism is globally very prevalent at all age groups and represents a non-communicable disease in which the risks and consequences are preventable³. TD affects people in developed, developing, and underdeveloped countries equally. Indians appear to be at increased risk for developing TD^{4,5}. Hypothyroidism is characterized by a broad clinical spectrum ranging from an overt state of myxedema, end-organ effects and multisystem failure to an asymptomatic or subclinical condition with normal levels of thyroxine and triiodothyronine and mildly elevated levels of serum thyrotropin⁶. Prevalence of hypothyroidism is high in India. Prevalence of hypothyroidism in India is around 10.95% as

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compared with 4.6% in USA and 2% in UK⁷. Reason behind high prevalence in India as compared to western countries is possibly due to long standing iodine deficiency in the country, which is partly corrected⁷. While the frequency of TD in India is substantial and increasing, there is significant variation between different regions⁸. Higher prevalence was seen in those areas, which are located inland (e.g., Delhi, Bangalore, Hyderabad and Ahmedabad) as compared to coastal cities (Chennai, Goa and Mumbai). Average prevalence in coastal cities is around 9.5% as compared to 11.7% in inland cities⁸. Prevalence also varies with age. As compared to people aged 18-35 years, people aged 46-54 years have higher prevalence (13.11% vs. 7.53%) of hypothyroidism⁹. The prevalence of Subclinical Hypothyroidism (SCH) in the developed world is about 4-15%⁶. Prevalence of SCH is also high in Indians (8.02-19.3%) as compared to Caucasians (3-8%)⁹. Patients of SCH may be asymptomatic but one third may have symptoms suggestive of thyroid hormone deficiency. SCH can be an early stage of thyroid hormone deficiency and may progress to overt hypothyroidism who have a family history, are inactive, and are overweight or obese⁸. Despite being such a common health issue in India, there is a paucity of data on the prevalence of hypothyroidism in adult population of India. On account of that, the current study has been conducted with the objective of calculating the prevalence of hypothyroidism in patients on OPD services.

MATERIALS AND METHODS

This was a cross-sectional, single-centered, institution based observational descriptive epidemiological study, conducted on patients attending OPD of Regiminal therapies, National Institute of Unani Medicine, Bengaluru for a period of one month from 1st June 2024 to 30th June 2024. Primary outcome measure of the study was the prevalence of hypothyroidism assessed by measurement of thyroid hormones. Secondary outcome measures were the prevalence of sub-clinical hypothyroidism (SCH), self-reported and undetected hypothyroidism in the study population. During the present study, a total of 550 patients were reviewed in OPD, 524 patients were enrolled in the study according to the present study inclusion criteria and 26 patients did not meet the inclusion criteria. Before enrolment, participants underwent medical history assessment, a general physical examination and laboratory investigations. Based on previous thyroid history and current thyroid function test results, participants were classified using following definitions:

Hypothyroid: Serum-free thyroxine (FT4) < 0.89 ng/dL and thyroid stimulation hormone

(TSH) > 5.50 μ IU/ml.

Hyperthyroid: Serum FT4 > 1.76 ng/dL and TSH < 0.35 μ IU/ml.

Subclinical hypothyroidism: Normal serum FT4 and TSH > 5.50 μ IU/mL.

Subclinical hyperthyroidism: Normal serum FT4 and TSH < 0.35 μ IU/ml,

Self-reported hypothyroidism: Subjects with history of hypothyroidism and taking levothyroxine therapy.

Undetected Hypothyroidism: Subjects without history of hypothyroidism and detected to have hypothyroidism through

thyroid function tests.

Inclusion criteria

All genders

Patients with age \geq 21 years attending the OPD.

Exclusion criteria

Age < , 21 years Pregnant females

Patients taking drugs (Lithium or steroids)

Given that every new patient seeking consultation in the outpatient department was assigned at random by a computerized patient management system to all of the attending physicians for the day, we expected our subjects to be representative of the overall patient population presenting to the hospital. The survey containing items to assess socio demographic profile like age, sex, identification data, education were collected by semi structured questionnaire.

Patients were provided detailed explanation of the protocol and study goals. The prior ethical clearance for the study was obtained from the institutional ethics committee and carried out in accordance with the approved protocol, principles of Declaration of Helsinki and Good Clinical Practices. Data analysis was done using SPSS version 24. The analysis was performed on the set of all eligible subjects enrolled in the study according to the study protocol. The prevalence of hypothyroidism and other thyroid disorders was summarized as counts and percentages.

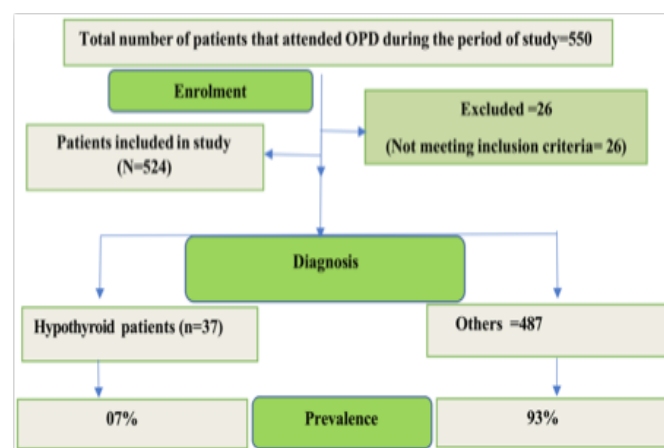


Figure A showing study design.

RESULT

An observational, single centered, descriptive cross-sectional study was conducted among 550 patients attending the general OPD of regiminal therapies, National Institute of Unani Medicine, Bengaluru from 01 June 2024 to 30 June 2024. Of the 550 patients that attended the OPD, only 524 patients met the inclusion criteria and constituted the study population. The remaining 26 patients were excluded as shown in Figure A. Out of the 524 analyzable subjects, 283 (54%) were females and rest 46% were males. The mean age of the study subjects was 48.85 years with a range of 18 to 100 years. Hypertension (n=188; 35.87%) and diabetes mellitus (n=100; 19.07%) were the most common concomitant diseases observed in the study

Table 1 Distribution of the study population according to socio demographic variables (N=584), (n=100).

S.No	Socio demographic variables	Hypothyroid patients(n)	Percentage of Hypothyroid subjects	Total	
				subjects Prevalence (N) %	Hypothyroid patients(n)
1	AGE (years)			524	7.06%
	21-30	1	2.70%		
	31-40	12	32.43%		
	41-50	9	24.32%		
	51-60	9	24.32%		
	Above 60	6	16.21%		
	TOTAL	37			
2	SEX				
	Male	9	24.32%		
	Female	28	75.68%		
	TOTAL	37			
3	EDUCATIONAL STATUS				
	Illiterate	11	29.72%		
	Primary	8	21.62%		
	Secondary	7	18.91%		
	Senior secondary	6	16.21%		
	Graduate	5	13.51%		
	TOTAL	37			
4	MEDICAL COMORBIDITIES				
	Hypertension	10	27.02%		
	Diabetes mellitus	11	29.72%		
	Heart disease	1	2.70%		
	Kidney Disease	1	2.70%		
	Liver disease	1	2.70%		
	Others(Arthritis,gout, chronic pain,migraine, gastritis etc.)	13	35.13%		
	TOTAL	37			

population. The prevalence of hypothyroidism in the overall study population was 7% (n=38, 95% CI) of which 4% (n=21) patients self reported the condition, whereas 3% (n=16) were previously undetected. Subclinical hypothyroidism (SCH) was observed in 21 (4%, 95% CI) participants. A total of 5 (1%, 95% CI) participants were diagnosed with hyperthyroidism as shown in Figure B. Table 1 revealed socio demographic profile of the study population. Most of the participants with hypothyroidism belonged to 31-40 years of age (32.43%), followed by 41-50 years and 51-60 years of age, (24.32%) each, 31-40, (16.21%). The prevalence of hypothyroidism was found to be higher in women (75.68%) than men (24.32%) (3:1) as shown in Figure C. As far as educational status is concerned, 29.72% patients diagnosed with hypothyroidism were illiterate; 21.62% had primary level of education; 18.91% had secondary level; 16.21% had senior secondary level and only 13.51% had an educational qualification of graduation and above. Regarding medical comorbidities, about 29.72% of

hypothyroid patients had diabetes, 27.02% had hypertension, 2.70% had either some diagnosed cardiac disease, renal disease or diagnosed liver disease and 35.13% had some other diseases as shown in Figure D. This study revealed an association of hypothyroidism with diabetes and hypertension (p value<0.05) as shown in Figure D below.

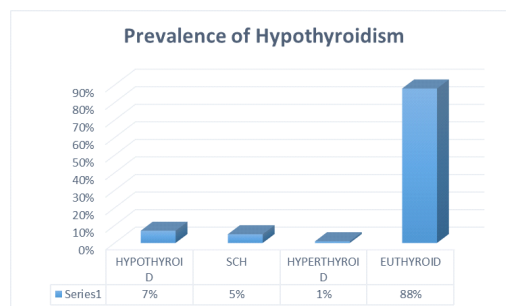


Figure B: Bar diagram showing Prevalence of Hypothyroidism

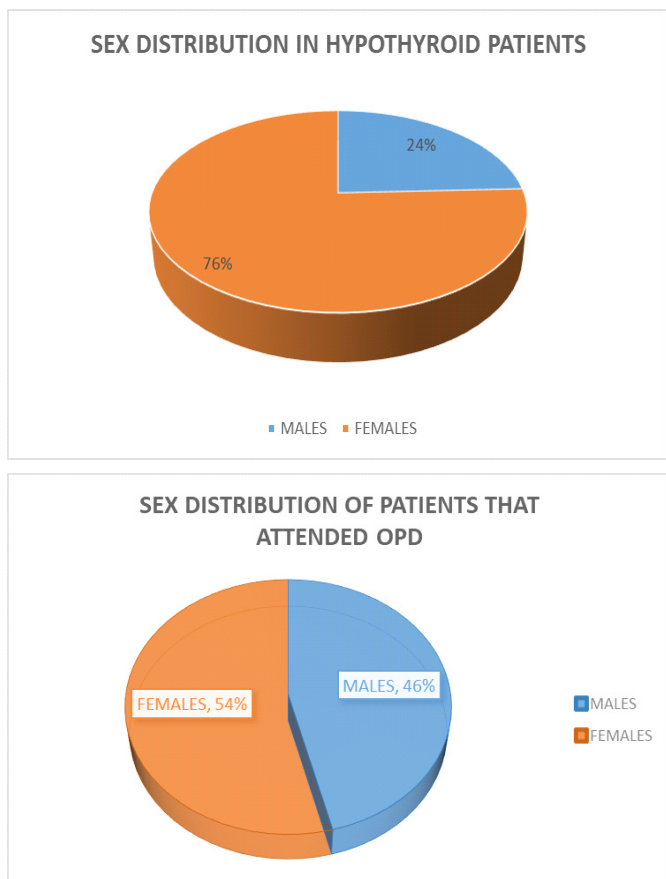


Figure C: Pie diagrams showing sex distribution of patients of sample population. (n=37)

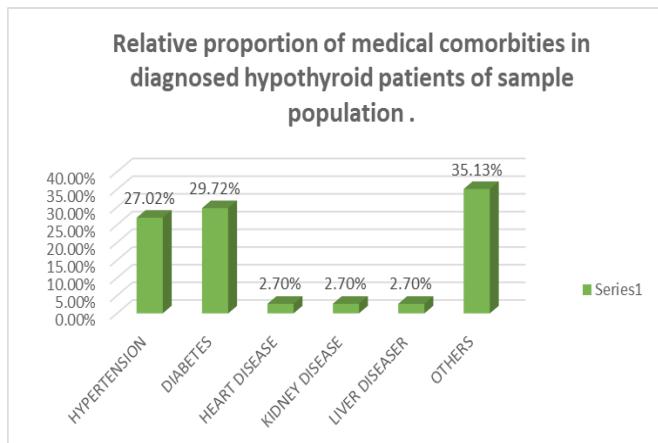


Figure D: Bar diagram showing relative proportion of medical comorbidities in diagnosed hypothyroid patients of sample population. (n=37).

DISCUSSION

Globally, the prevalence of non-communicable diseases is rising quickly. In comparison to communicable disease, non-communicable diseases have a greater impact on the population's health profile. Thyroid disorders pose a significant economic burden on healthcare systems worldwide. India, despite being in postiodization era, where iodine depletion is replaced by iodine sufficiency, thyroid disorders are increasing throughout the country, predominantly hypothyroidism. Hypothyroidism is the most common thyroid disorders in India, affecting one in ten adults. Hypothyroidism is an emerging health issue in India and worldwide. Untreated hypothyroidism can contribute to

hypertension, dyslipidemia, infertility, cognitive impairment, and neuromuscular dysfunction. Hypothyroidism occurs as a result of failure of thyroid gland or insufficient or inadequate thyroid gland stimulation by the hypothalamus or pituitary gland. The thyroid gland produces hormones that influence every cell, tissue, and organ in the body. Thyroid hormones regulate the body's metabolism and affect critical body functions, such as energy level and heart rate. The most stunning statistic is that up to 60% of those with thyroid disease are unaware of their condition and that women are five to eight times more likely than men to have thyroid problems. The current study findings confirmed that thyroid disorders, mainly hypothyroidism is common in adult Indian general population. The present study depicted that the overall prevalence of hypothyroidism in study population was found to be 07%, which can be compared with some previous studies conducted in India and abroad. Our study was planned as a feasibility study, the first of its kind in our institute, to determine community-based prevalence of the rising problem of hypothyroidism. Our study findings were coherent with the study conducted by Bajaj, et al on thyrovigilance for hypothyroidism in india. The prevalence of hypothyroidism was found high, ranging from 7%–11%, which supports the present study¹⁰. Also data from other study conducted by Devaraj et al. for the estimation of prevalence of hypothyroidism in Kannur; a coastal district in Kerala favours our study¹¹. Their study revealed that the prevalence of hypothyroidism was approximately 9.6% of adult in the study population. Female gender (odds ratio = 1.791) were found to have significant association with hypothyroidism. According to European prevalence estimates¹², hypothyroidism affects up to 5% of the population which is closely related to our study findings. Female preponderance in prevalence noted in our study have been reported previously on numerous studies^{10,11}.

Like other studies our study also had some shortcomings. The current study was an Institution based cross sectional study; Data from only one OPD was taken. The investigators presume that iodine content in the body is sufficient without testing iodine markers such as urinary iodine excretion. The mark of autoimmunity (antiTPO) was not tested in the current study. The current study did not compare the comorbidities between euthyroid and hypothyroid patients. To summarize, the present study threw light on the prevalence of hypothyroidism among the adult population attending NIUM, Bengaluru. The study revealed the prevalence of hypothyroidism to be 07%

CONCLUSION

Hypothyroidism is an emerging health issue in India and worldwide. India, despite being now in postiodization era, where iodine depletion is replaced by iodine sufficiency, thyroid disorders are increasing throughout the country, predominantly hypothyroidism. The prevalence of hypothyroidism is 10.95% and there is clear evidence of more prevalence among females than males. Untreated hypothyroidism can contribute to diabetes, hypertension, dyslipidemia, infertility, cognitive impairment, and neuromuscular dysfunction. Despite being easy to detect and inexpensive in treatment, patients with hypothyroidism are undetected and it affects their quality of life, work performance, and economic productivity. This could have a great influence on the overall healthcare expenditure in India. The present study provided some idea about prevalence of hypothyroidism among patients of Bengaluru, India. In this

study the overall prevalence of hypothyroidism among patients who reached out to OPD of NIUM, Bengaluru for the management of their morbidities was found to be 7%. This study also showed positive association between hypothyroidism and some medical comorbidities like diabetes and hypertension. The prevention and management of thyroid disorders and associated complications is a huge challenge in India due to several issues and barriers, including lack of multisectoral approach, surveillance data, awareness regarding thyroid disorders, its risk factors and complications, access to health care settings, access to affordable medicines, etc. Thus, effective health promotion at both, individual and population levels are the need of the hour to curb the thyroid disorders and reduce its related complications in India.

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DECLARATION OF COMPETING INTEREST

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and publication of this article

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