



PATTERN OF THYROID PROFILE IN A TERTIARY CARE CENTRE OF MAVAL TALUKA

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ABSTRACT

Background: Thyroid disorders are a widespread endocrine problem, but data on their prevalence in India is scanty. **Aims and Objective:** The aim of the present study was to assess the pattern of various thyroid disorders in subjects attending a tertiary care center. **Materials and Methods:** This retrospective hospital based study involved 500 patients who underwent thyroid function test, in the central clinical laboratory. Thyroid function tests were performed using Standard kit (AccuBind) by ELISA. Statistical analysis was performed using appropriate statistical tests. **Hypothesis:** With the background that Maval Taluka has optimum iodine nutrition, we undertook this pilot study with an intention to confirm whether it is concordant with the practical scenario. **Results:** We found 21% subjects having thyroid disorders in our study population. Out of these, 5.4% were overt hypothyroid, 6.2% were subclinical hypothyroid, 4.2% overt hyperthyroid and 5.2% were found to be subclinical hyperthyroid. Thyroid disorders showed female predilection. **Conclusion:** Our study suggested that the prevalence of thyroid disorders in our study population is high and hypothyroidism is more common than hyperthyroidism. Highest prevalence of thyroid disorder was found in 21-40 years age group. Evaluation of thyroid status of particularly the reproductive group could help in early diagnosis and treatment.

KEYWORDS: Hypothyroidism, Hyperthyroidism, TSH.

INTRODUCTION

Diseases of the thyroid gland are among the most abundant endocrine disorders worldwide second only to diabetes, India is no exception. 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.^[1] Thyroid disease is being increasingly diagnosed with greater awareness and is one of the chronic non-communicable diseases affecting women more, though the male population is not spared of the ailment.^[2]

The signs and symptoms of hyper and hypothyroidism are well known and on the other hand subclinical thyroid condition may mimic other diseases.^[3] Overt thyroid dysfunction is associated with significant morbidity and mortality. Both hypothyroidism and hyperthyroidism have been linked with increased risk of cardiovascular disease and the adverse effects of thyrotoxicosis in terms of osteoporosis are well established. Hypothyroidism itself contributes to morbidity from hyperlipidemia, hypercholesterolemia and neuropsychiatry diseases in the population.

The seriousness of thyroid disorders should not be underestimated as thyroid storm and myxedema coma can lead to death in a significant number of cases.^[4,5] So it is important to develop laboratory strategies to differentiate the various conditions for correct diagnosis and treatment.^[6] Serum TSH measurement is the most important and sensitive test for screening hypo or hyperthyroidism because serum TSH has a Log Linier relationship with circulating thyroid hormone levels.^[7]

The prevalence and pattern of thyroid disorders depends on sex, age, ethnic and geographical factors and especially on iodine intake.^[8] After successful salt iodination adopted by the Indian government WHO assessment status classified India as having optimal iodine nutrition in 2004^[9] still thyroid disorders contribute significantly to the burden of thyroid disorders in India.^[10]

In spite of this high prevalence, screening for thyroid disorders is not recommended by any major health agency.^[9] For the management strategies of health care programs, it is necessary to know the prevalence of the hypo and hyper thyroid disorders in the regional

population^[2] for which data available for Indian population is scanty.^[11] Thus, thyroid diseases being 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.^[11]

MATERIALS AND METHODS

The current study was a retrospective observational hospital based study, which after approval from the Institutional Ethics Committee was carried out from January 2017 to May 2017 (5 months) involving 500 subjects with suspicion of thyroid disorder who were subjected to thyroid function assay conducted in the department of Biochemistry, MIMER Medical College, Talegaon Dabhade, Pune. Serum values of individuals with suspicion of thyroid dysfunction subjected to thyroid profile (Total T4, Total T3 and TSH) which was estimated by ELISA by Standard Kit (AccuBind) was procured from the registers.

The normal ranges of thyroid hormone profile are shown in Table 1. The data collected was analyzed using Excel 2007 and appropriate statistical tests were used. P 0.05 is considered as statistically significant.

RESULT

The current study included a total of 500 subjects and females 83.6% (n=418) were more in number compared to males 16.4% (n=82). A total of 45.2% (n=226) of the subjects were of the age group less than 30 years, 38.2% (n=191) were of the age group between 31 and 50 years and 16.6% (n=83) were above 50 years. The highest number of subjects was in the 21- 30 age group (35.8%) and lowest number of subjects was in the >71 age group (2.2%).

The distribution of various thyroid disorders is depicted in Figure I. As per the overall frequency of thyroid disorders along with percentage and 95% CI described in Table II, out of 500 with suspected thyroid disorder, 79% (n=395) were categorized as euthyroid. Subclinical hypothyroidism was detected in 6.20% (n=31) subjects while overt hypothyroidism was detected in 5.40% (n=27) subjects. Overt hyperthyroidism was seen in 4.2% (n=21) subjects while subclinical hyperthyroidism was detected in 5.20% (n=26) subjects.

The gender wise distribution of thyroid disorders is seen in Figure II. As shown in Table III, thyroid disorders have a female preponderance which is significant.

The study cohort was divided in seven age groups to determine the occurrence of various thyroid disorders in different age groups as shown in Table IV. The age group division was 0-20 years, 21 to 30 years, 31 to 40 years, 41-50 years, 51-60 years, 61-70 years and more than 71 years.

As per the age wise distribution of thyroid cases, in our study, maximum number of euthyroid cases were seen in the 21-30 age group n=150, 37.97% while minimum number was seen in more than 71 age group n=9, 2.27%. Maximum number of hypothyroid cases was seen in 31-40 age group n=17, 29.31% of which n=11, 9.16% were sub clinically hypothyroid and n=6, 5% were clinically hypothyroid while minimum number of cases were seen in the more than 71 age group n=2, 3.44%. Maximum number of hyperthyroid cases were seen in the 21-30 age group n=13, 27.65% of which n=6, 3.35% were sub clinically hyperthyroid whereas n=7, 3.91% were clinically hyperthyroid. There were no hyperthyroid cases in the more than 71 age group.

Table I: Normal ranges of Thyroid Profile.

Thyroid Disorder	T3(ng/ml)	T4 (µg/dl)	TSH (µIU/ml)
Euthyroid	0.52-1.85	4.8-11.6	0.39-6.16
Overt Hypothyroidism	<0.52	<4.8	>6.16
Subclinical Hypothyroidism	Normal	Normal	>6.16
Overt Hyperthyroidism	>1.85	>11.6	<0.39
Subclinical Hyperthyroidism	Normal	Normal	<0.39

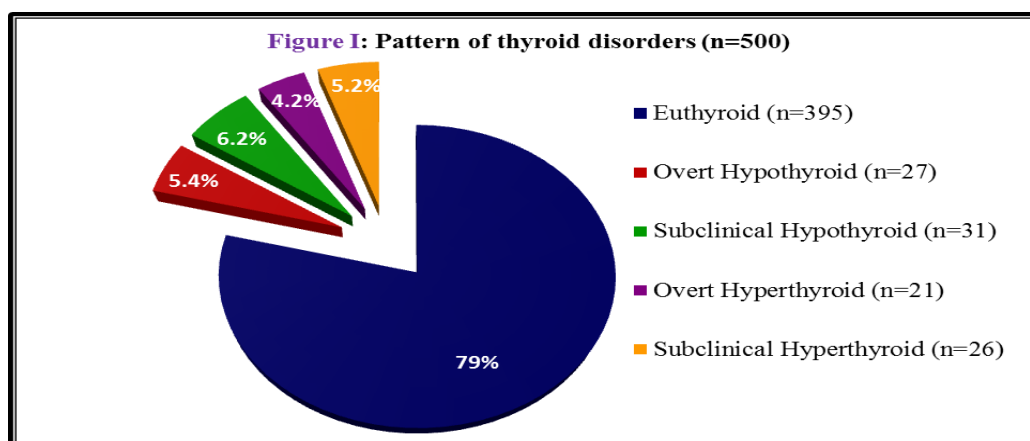


Table II: Overall distribution of thyroid cases.

Thyroid Disorder	No of patients	Percentage (%)	95 %	CI
			LL	UL
Euthyroid	395	79	75.22	82.34
Overt Hypothyroidism	27	5.4	3.74	7.74
Subclinical Hypothyroidism	31	6.2	4.4	8.67
Overt Hyperthyroidism	21	4.2	2.76	6.34
Subclinical Hyperthyroidism	26	5.2	3.57	7.51

CI: Confidence Interval; LL: Lower Limit; UL: Upper Limit.

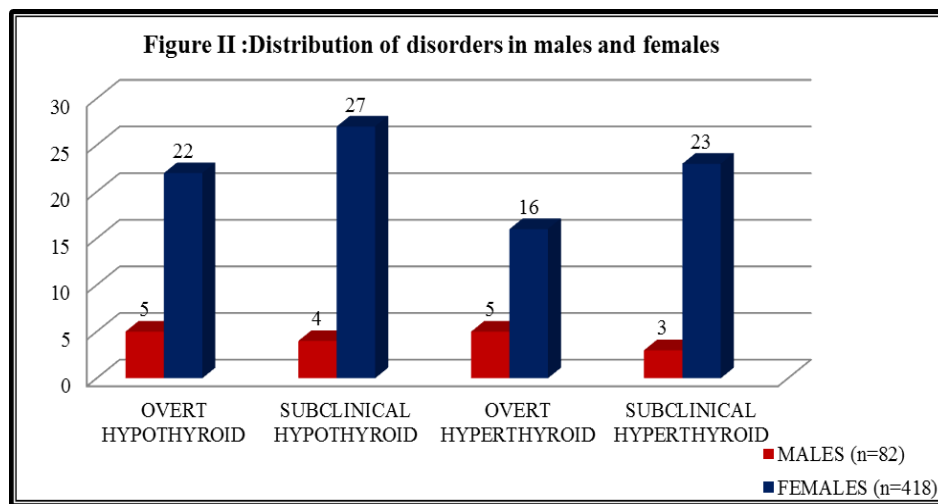


Table III: Distribution of thyroid cases according to sex.

Thyroid Disorder	Males (82)		Females (418)		Z value	P
	n	%	n	%		
Euthyroid	65	16.45	330	83.54	-18.8566	0*
Overt Hypothyroidism	5	18.51	22	81.48	-4.6268	0*
Subclinical Hypothyroidism	4	12.90	27	87.09	-5.842	0*
Overt Hyperthyroidism	5	23.80	16	76.19	-3.3947	0.0007*
Subclinical Hyperthyroidism	3	11.53	23	88.46	-5.547	0*

*Significant.

Table IV: Distribution of thyroid cases according to age.

Thyroid Disorder	Euthyroid n=395		Hypothyroid n=58		Hyperthyroid n=47	
	n	%	N	%	n	%
0-20	38	9.62	6	10.34	3	6.38
21-30	150	37.97	16	27.58	13	27.65
31-40	91	23.03	17	29.31	12	25.53
41-50	56	14.17	8	13.79	7	14.89
51-60	36	9.11	6	10.34	9	19.14
61-70	15	3.79	3	5.17	3	6.38
>71	9	2.27	2	3.44	-	-

DISCUSSION

The data available regarding the thyroid status in Maval Taluka is scanty as no such study has been carried out. Hence this study was undertaken as a pilot study in a Tertiary Care Centre in Maval Taluka. In our study, out of total 500 patients suspected with thyroid disorder, highest number (82%) of subjects were reported to be euthyroid with normal levels of T3, T4 & TSH. A similar hospital based study was conducted by Sonam *et al*^[3]

which reported 83% euthyroid cases and a study conducted by Rebecca *et al*^[12] showed 84.2% euthyroid cases.

Among the thyroid disorders, subclinical hypothyroidism (6.2%) was found to be most prevalent followed by overt hypothyroidism (5.4%) and overt hyperthyroidism (5.2%) as opposed to a hospital based study conducted by Arindam *et al*^[2] in Central India where overt

hypothyroidism was most prevalent (7.45%) followed by subclinical hypothyroidism (6.31%) and overt hyperthyroidism (1.79%) and in accordance with the study by Rebecca *et al*^[12] where 9.5% were subclinical hypothyroidism cases followed by 2% overt hypothyroidism cases and 1.2% overt hyperthyroidism cases.

The numbers of females were higher (n=88) indicating a higher prevalence of thyroid dysfunction in women than men (n=17). This is also comparable to a study conducted by Sonam *et al*^[3] in Sikkim.

Our study showed maximum number of disorders in the 21-40 age groups. Various studies support the observation that maximum number of thyroid cases was seen in the age group of 21-30 years followed by 31-40 age group.^[13] Similar findings were obtained in a study conducted in Jammu and Kashmir.^[14]

Thus, the major burden of thyroid disorders is on reproductive age groups. If left untreated, hypothyroidism can cause elevated cholesterol levels, an increase in blood pressure, an increased rate of cardiovascular complications, decreased fertility, and depression; and in pregnant women, placental abnormalities and increased risks for the baby's wellbeing.

CONCLUSION

Based on our findings, we first believe that widespread routine screening is important to identify those individuals susceptible to or having preexisting thyroid disorders. This is especially important in that the signs and symptoms of thyroid dysfunction mimic those of many other common diseases. Secondly, the study findings call for a review of current practices in the management of thyroid disorders because of high prevalence of thyroid disorder in the reproductive age group (21-40). Thyroid disorders must be actively screened and monitored as early detection and management form the cornerstone of treatment.

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