

Proportions of thyroid disorders in bhopal- a hospital based study

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Abstract

Introduction: Thyroid disorder are multifactorial with contributions from genetic and environmental factors. The principal diseases of thyroid gland are goitre, hypothyroidism, hyperthyroidism, thyroiditis and neoplasms. Estimation of thyroid hormones and TSH are essential in arriving at a diagnosis of thyroid dysfunction.

Objectives: To find out spectrum of thyroid dysfunction among study participants and to assess the association of thyroid disorders with socio-demographic variables

Material and Methods: This was a facility based cross sectional study in Department of Biochemistry, for a period of one year from 1st April 2017 to 31st March 2018. All the individuals reporting for thyroid function tests in Biochemistry department for first time were included in the study using systematic random sampling. All participants included in the study were interviewed and information was recorded on a questionnaire.

Observations: The mean age of study participants was 31.9±12.0 years. 414 (67.9%) participants were euthyroid, 158 (25.9%) were diagnosed as hypothyroid (21.8% subclinical and 4.1% overt), while only 38 (6.2%) were diagnosed as hyperthyroid (3.1 subclinical and 3.1 overt).

Keywords: Thyroid, Hypothyroidism, Hyperthyroidism, Spectrum, Bhopal.

Introduction

Thyroid disorder is defined as the abnormal levels of thyroid stimulating hormone (TSH) with normal or abnormal thyroid hormone.¹ These diseases are multifactorial with contributions from genetic and environmental factors.² The principal diseases of thyroid gland are goitre (diffuse or nodular), hypothyroidism, hyperthyroidism, thyroiditis and neoplasms. The biochemical and clinical classification of thyroid disorders include primary disorders due to thyroid gland dysfunction itself such as primary hypothyroidism and primary hyperthyroidism. Secondary disorders due to pituitary gland disorder include secondary hypothyroidism and secondary hyperthyroidism. Tertiary disorders due to hypothalamic diseases include tertiary hypothyroidism and hyperthyroidism respectively.³

With the improvement in diagnostic modalities and easy availability of thyroid function tests, screening of thyroid disorders have increased. The prevalence of thyroid disorders depend upon age, gender, ethnicity, geographical location and iodine status.⁴ The exact prevalence of thyroid disorders are still unknown. In a hospital based study from South India, the percentage of patients suffering from hypothyroidism, subclinical hypothyroidism and hyperthyroidism were 35.85%, 7.5% and 4.26% respectively. The prevalence of hypothyroidism was found to be highest in females (33.52%) as compared to males (2.32%) and that of hyperthyroidism in females (4.06%) and (0.19%) in males.⁵

Estimation of thyroid hormones and TSH are essential in arriving at a diagnosis of thyroid dysfunction. With the broad objective of identifying the proportion of thyroid disorders amongst study, the present study was conducted at Gandhi

Medical College which is a tertiary care centre, where the patients are referred from different parts of Bhopal.

Objectives

1. To study the socio-demographic profile of individuals reporting for thyroid function tests in Gandhi Medical College Bhopal.
2. To find out spectrum of thyroid dysfunction among study participants.
3. To assess the association of thyroid disorders with socio-demographic variables.

Material and Methods

This study was designed as a facility based cross sectional study in Department of Biochemistry, Gandhi Medical College, Bhopal for a period of one year from 1st April 2017 to 31st March 2018. A month wise list of total number of individuals reported for getting their thyroid function tests for the year 2016 was obtained from the department of Biochemistry, Gandhi Medical College, Bhopal. The total individuals registered in Biochemistry department in the given year were estimated to be 6038. For calculating the sample size, 10% of this was taken which came out to be 603.8. Hence a total sample of 610 was included in the study. All the individuals reporting for thyroid function tests in Biochemistry department for first time and giving consent for the study were included in the study using systematic random sampling. Severely ill patients, admitted patients, known case of thyroid disorders, participants already taking thyroid medications were excluded from study.

After obtaining informed consent, all participants included in the study were interviewed and information was recorded on a predesigned, pretested and semi-structured questionnaire. The questionnaire included socio-demographic variables such as age, gender, referral from which department.

Following this, selected participants were sent to blood collection room for their blood collection for thyroid function tests. T3, T4, and TSH level were estimated using ELISA technique. Data was entered into MS excel 2007, analysis was done with the help of Epi-Info 7 software. Frequency and percentage were calculated & statistical test (Chi Square) was applied wherever applicable; $P < 0.05$ was taken as statically significant.

Observations and Results

A total of 610 participants were registered over a period of one year for the study

The mean age of study participants was 31.9 ± 12.0 years with maximum (41.9%) between 21-30 years followed by 31-40 years of age in 25% participants. Majority (89.9%) of participants were female, while only 10.1% participants were males. Mean age of males was 33.5 ± 15.2 and that of females was 31.8 ± 11.6 years.

Out of 610 randomly selected participants, 414 (67.9%) participants were euthyroid, 158 (25.9%) were diagnosed as hypothyroid (21.8% subclinical and 4.1% overt), while only 38 (6.2%) were diagnosed as hyperthyroid (3.1 subclinical and 3.1 overt).

In participants diagnosed as subclinical hypothyroidism,

majority (36.1%) of participants belonged to 21-30 years of age, followed by 31-40 years of age group (22.6%). Similarly, 32% and 28% participants belonged to 21-30 years and 31-40 years age group amongst participants diagnosed with overt hypothyroidism. Among participants with hyperthyroidism, majority (42.1%) of participants belonged to 21-30 years of age in subclinical hyperthyroidism and 31.6% participants each in age group of 21-30 years and 31-40 years in overt hyperthyroidism. Test of significance was applied and there was no statistical association between age group and spectrum of thyroid disorders ($p > 0.05$).

Majority of participants in present study were females (89.8%). Amongst participants diagnosed as subclinical hypothyroidism, overt hypothyroidism, 88% and 92% were females. Similarly amongst subclinical and overt hyperthyroid participants 94.7% were females and rest were males. Test of significance was applied between gender and spectrum of thyroid disorders and the present study could not find statistical association between gender and thyroid disorders ($p > 0.05$).

Out of 325 participants referred from Medicine Department, 62.7% were euthyroid, similarly 77.4% participants referred from Obstetrics and Gynaecology department 77.4% were euthyroid. Others department included paediatrics, emergency, psychiatry and ophthalmology.

Table 1: Distribution of study participants according to age and gender

Age Group	Male		Female		Total	
	N	%	N	%	N	%
<20	13	21	69	12.6	82	13.4
21-30	17	27.4	238	43.4	255	41.9
31-40	14	22.6	139	25.4	153	25.0
41-50	10	16.1	62	11.3	72	11.8
>50	8	12.9	40	7.3	48	7.9

Table 2: Association of age with thyroid disorders

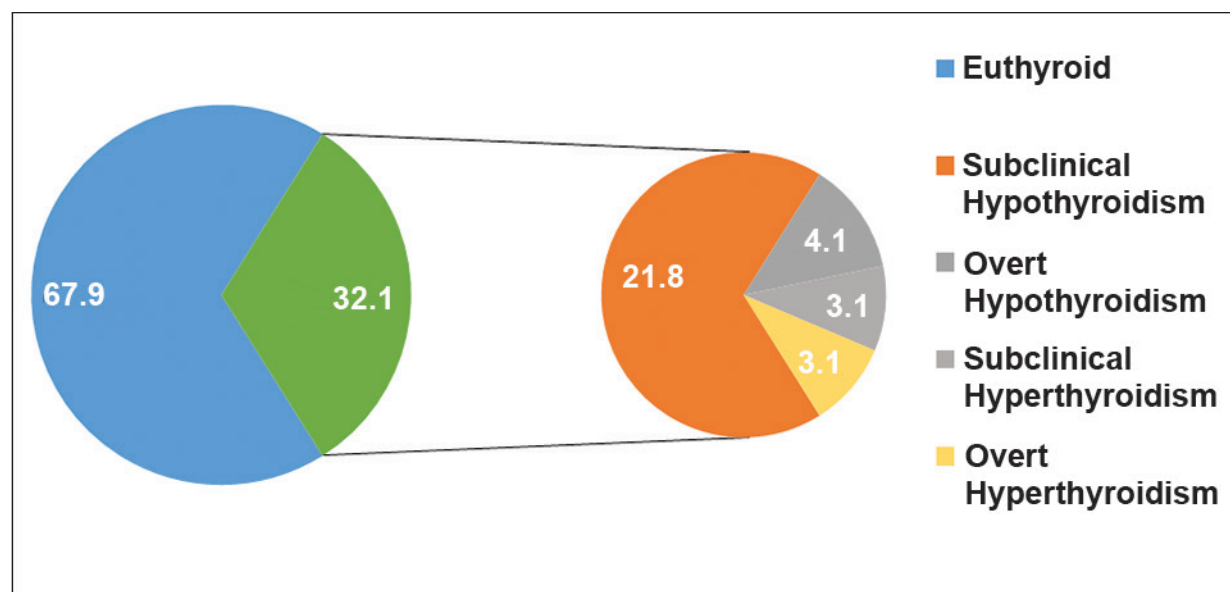
S No.	Age group	Euthyroid (%)	Hypothyroidism		Hyperthyroidism		Total (%)
			Subclinical (%)	Overt (%)	Subclinical (%)	Overt (%)	
1	<20	57 (13.8)	15 (11.3)	4 (16)	3 (15.8)	3 (15.8)	82 (13.4)
2	21-30	185 (44.7)	48 (36.1)	8 (32)	8 (42.1)	6 (31.6)	255 (41.8)
3	31-40	108 (26.1)	30 (22.6)	7 (28)	2 (10.5)	6 (31.6)	153 (25.1)
4	41-50	42 (10.1)	22 (16.5)	3 (12)	2 (10.5)	3 (15.8)	72 (11.8)
5	>50	22 (5.3)	18 (13.5)	3 (12)	4 (21.1)	1 (5.2)	48 (7.9)
Total		414	133	25	19	19	610
p=0.09							

Table 3: Association of gender with thyroid disorders

S No.	Gender	Euthyroid (%)	Hypothyroidism		Hyperthyroidism		Total (%)
			Subclinical (%)	Overt (%)	Subclinical (%)	Overt (%)	
1	Males	42 (10.1)	16 (12)	2 (8)	1 (5.3)	1 (5.3)	62 (10.1)
2	Females	372 (89.9)	117 (88)	23 (92)	18 (94.7)	18 (94.7)	548 (89.9)
Total		414	133	25	19	19	610
p=0.8							

Table 4: Distribution of study participants according to referring departments and spectrum of thyroid

S No.	Department	Euthyroid (%)	Hypothyroid (%)		Hyperthyroid (%)		Total
			Subclinical	Overt	Subclinical	Overt	
1	Medicine	204 (62.7)	87 (26.8)	14 (4.3)	10 (3.1)	10 (3.1)	325
2	OBG	164 (77.4)	30 (14.2)	7 (3.2)	6 (2.8)	5 (2.4)	212
3	Dermatology	16 (72.7)	5 (22.7)	1 (4.5)	0 (0)	0 (0)	22
4	ENT	9 (40.9)	5 (22.7)	3 (13.6)	2 (9.1)	3 (13.6)	22
5	Orthopedics	9 (90)	1 (10)	0 (0)	0 (0)	0 (0)	10
6	Surgery	6 (75)	1 (12.5)	0 (0)	1 (12.5)	0 (0)	8
7	Others	6 (54.5)	4 (36.4)	0 (0)	0 (0)	1 (9.1)	11
8	Total	414 (67.9)	133 (21.8)	25 (4.1)	19 (3.1)	19 (3.1)	610

**Fig. 1:** Distribution according to spectrum of thyroid disorders

Discussion

The mean age of study participants in present study was 31.9 ± 12.0 years, maximum (41.9%) belonged to 21-30 years of age group. The mean age of participants in a study by Adhikari BR et al⁶ was 45.9 ± 1.3 years and majority (59%) belonged to 36-55 years of age. Majority of participants were female (89.9%) in present study similar to study by Savery D et al⁷ in which 90% and 78.9% participants were female.

The proportion of thyroid disorders was found to be 32.1% in present study, hypothyroidism contributing to 25.9% (21.8% subclinical and 4.1% overt) and hyperthyroidism 6.2% (3.1% subclinical and overt each) and rest 67.9% participants were euthyroid. The spectrum of thyroid disorders found in present study was similar to findings of Mahato RV et al. They reported thyroid disorders in 36.1% participants maximum being subclinical hypothyroidism (16.9%) followed by overt hypothyroidism (11.6%).⁸

Dange NS et al. (2015) also reported 31.3% prevalence of thyroid disorders, but majority of participants were overt hypothyroidism (15.9%) followed by subclinical hypothyroidism (6.7%), overt hyperthyroidism (5.0%) and subclinical hyperthyroidism (3.6%).¹

However, no statistical significance could be associated between age group and spectrum of thyroid disorders ($p > 0.05$) in present study. These findings were similar to study by Dange NS et al. (2015), they found no significant difference ($p = 0.7301$) among the age groups having different thyroid dysfunction status.¹

Present study could not find association of gender with thyroid disorders ($p > 0.05$). These findings were similar to a study by Dange NS et al. (2015) and Gupta HP et al. (2015), in which there was no significant difference in the thyroid dysfunction status of male and female ($p = 0.482$ and 0.473 respectively).^{1,9}

Limitations

1. Only thyroid function tests were conducted amongst study participants, further investigations to rule out causes of thyroid disorders, whether the disorders are primary or secondary, association with auto-antibodies, lipid profile and other co-morbidities could not be done.
2. Being a cross sectional study, the study only focused on spectrum of thyroid disorders, however a prospective follow up community based study with detailed

laboratory work up would have revealed a complete picture of thyroid disorders in terms of their prevalence, causes and associated co-morbidities.

Conflict of Interest: None.

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