Volume : 5 | Issue : 8 | August 2016 • ISSN No 2277 - 8179 | IF : 3.508 | IC Value : 69.48

Original Research Paper

Prevalence of Thyroid Disorders in Population of Moradabad

Medical Science

KEYWORDS : T3, T4, TSH, Hyperthyroidism, Hypothyroidism

*** Vivechana**	Assistant professor TMU College of Paramedical Sciences, Moradabad (U.P), * Corresponding author
Vikash	Assistant professor TMU College of Paramedical Sciences, Moradabad (U.P)
Barun Kant Dixit	Student of BHMS 4th year . VRHMC Chirwai Naka Mahadji Nagar GWL.
Raju chauhan	BMLT –III year student

ABSTRACT

Objective: *Thyroid is a global problem, Moradabad is situated in the middle of the Ramganga and the Ganga River because several of rivers show annual flooding which inundate the soil and leach away its iodine content. Objective of this study was to assess the prevalence of thyroid stimulating hormones (TSH) in various age group in TMMH & RC Moradabad.*

Material & Method:- *This was hospital based prospective study from 01/06/2015 to 30/11/2015 to collect of different age group patients from TMMH & RC. A cross-sectional study was used to identify the case of TSH disordered patients.*

Result: - *Prevalence of thyroid disorders was higher in female in comparison to male. Increased and decreased serum TSH level with respect to age and gender.*

Conclusion:- *higher prevalence of TSH was in female patients during 20 to 40 years of age.*

Introduction

TSH is the major regulator of the morphologic and functional states of the thyroid. All steps in the formation and release of thyroid hormones are stimulated by TSH secreted by the pituitary thyrotrophs. Thyroid cells express the TSH receptor (TSHR), a member of the glycoprotein G protein–coupled receptor family. It is a glycoprotein secreted by the thyrotrophs in the anteromedial portion of the adenohypophysis. In normal serum, TSH is present at concentrations between 0.4 and 4.2mU/L. The level is increased in primary hypothyroidism and reduced in thyrotoxicosis. The plasma TSH half-life is about 30 minutes, and production rates in humans are 40 to 150mU/day. There is a linear inverse relationship between the serum free T4 concentration and the log of the TSH, making the serum TSH concentration an exquisitely sensitive indicator of the thyroid state of patients with an intact hypothalamic-pituitary axis.[1]

A state that results in a deficiency of thyroid hormones, including hypothalamic or pituitary disease and generalized tissue resistant to thyroid hormone, and disorders that affects the thyroid gland directly.[2]

The burden of thyroid disease in the general population is enormous. Thyroid disorders are the most common among all the endocrine diseases in India.[3] A major burden of thyroid diseases in the community comprises of iodine deficiency diseases, congenital hypothyroidism, nodular goitres (toxic, non toxic), Graves' thyotoxicosis, and Hashimoto's thyroiditis with hypothyroidism, thyroid malignancies and thyroid diseases associated with pregnancy. Patients with severe hypothyroidism generally present with a group of signs and symptoms that may include lethargy, weight gain, hair loss, dry skin, forgetfulness, constipation and depression. Not all of these signs and symptoms occur in every patient, and many may be blunted in patients with mild hypothyroidism.[4] Hypothyroidism is ten times more common in women than men and its prevalence increases with age. The prevalence of thyroid dysfunction, by definition, is testing patients in various geographic regions, primary care clinics and in population that have not been screened previously.[5-6] Uncontrolled hyperthyroidism in pregnancy can lead to various maternal complications include miscarriage, infection, preeclampsia, preterm delivery, congestive heart failure, thyroid storm, and placental abruption. Fetal and neonatal complications include prematurity, small for gestational age babies, intrauterine fetal death, toxemia, and fetal or neonatal thyrotoxicosis.[7]Maternal complications of untreated hypothyroidism include anemia, preeclampsia, placental abruption,postpartum hemorrhage, cardiac dysfunction, and miscarriage. Fetal or neonatal complicationsinclude prematurity, low birth weight, congenitalanomalies, stillbirths, and poor neuropsychological development. Around 42 million Indians are suffering from thyroid disorders and about 200 million people are at risk of Iodine deficiency disorders in India.[8] Responsible for the damage done to the developing brain and the other harmful effects known collectively as the Iodine Deficiency disorders (IDDs).[9] Despite the coverage of National iodine deficiency diseases control programme (NIDDCP) in India, iodine deficiency is still prevalent in many parts of India.[10] The principal diseases of thyroid gland are goiter (diffuse or nodular), hypothyroidism, hyperthyroidism, thyroiditis and neoplasms. The simple goitre is extremely common throughout the world and is most prevalent in mountainous areas. Thyroid diseases are multifactorial with contributions from genetic and environmental factors (Tsegaye and Ergete, 2003).[11] Simple goiter is most prevalent in mountainous areas but also occur in non-mountainous areas remote from sea. Iodine deficiency is the major cause for thyroid diseases. Not only the iodine deficiency but increased iodine consumption is strongly implicated as a trigger for thyroiditis. There are a wide variety of chemicals other than iodine that affect the thyroid gland or have ability to promote immune dysfunction in the host (Chandra, 2011).Deficiency of iodine in food in food and water leads to an abnormal swelling in the neck called goitre and other iodine deficiency disorders (IDDs). When iodine intake falls below the recommended levels, the thyroid is no longer able to synthesise sufficient amounts of thyroid hormone. The resulting low level of thyroid hormones in the blood (hypothyroidism) is the principal factor responsible for the damage done to the developing brain and the other harmful effects known collectively as the iodine deficiency disorders (IDDs)[12] Soon after the 'Kangra Valley Study' as the field study was popularly called, the Government of

Volume : 5 | Issue : 8 | August 2016 • ISSN No 2277 - 8179 | IF : 3.508 | IC Value : 69.48

india decided to initiate a national programme in view of the fact that goitre was considered a public health problem that needed to be controlled. Thus, as mentioned earlier, the National Goitre Control programme (NGCP) came into existence in 1962. [13]

In june 1992, the national goitre control programme was appropriately redesignated as the 'national iodine deficiency disorders control programme (NIDDCP)' in recognition of the spectrum of disorders due to iodine deficiency. Spectrum of Iodine Deficiency Diseases-

Fetus	Abortions, Still births, Congenital anomalies,Neurologic cretinism, Myxedematous cretinism Psychomotor defects
Neonate	Increased perinatal mortality, Neonatal hypothyroidism, Retarded mental and physical Development Child and Adolescent Increased infant mortality, Retarded mentaland physical development
Adult	Goitre and its complications, Iodine induced hyperthyroidism
All Ages	Goitre, Hypothyroidism, Impaired mental function, Increased susceptibility to nuclear radiation.

Due to lack of literature of thyroid disorder in Moradabad, we were planned this study on this population.

Mterial and Methods :- This study was performed in TMU& RC, Moradabad . Data collection of 734 patients of thyroid disorder along with altered thyroid profile T3, T4, TSH. The values were comparable in both the sexes in different age group. microplale immunoenzymometric assay was used for the determination of thyroid profile. [15]

Normal value –

T3 –	6-1.85ng/ml
T4-	4.8-11.8 µg/dl
TSH-	0.19-6.16 µIU/l

After overnight fasting three ml of venous blood samples were collected in morning in plain vials under aseptic conditions. Blood was allowed to clot and centrifuged at 3000 rpm for 15 minutes at room temperature. The supernatant serum was assayed for T3, T4 & TSH *Laboratory Tests* ..

Result

In our study we were found that Study of TSH was done of 734 patients out of these 25% were male and 75 % were female. High TSH of male was 20.5%, On the other hand TSH of female was 77.3%. According to hormonal status in female was 2.2% of level of higher T_3 and 19.4% males were suffering from t_4 less level hormonal status & 74.6% females.

Prevalence TSH in the age group under 20 was 9.3% in which male percentage was 2.3 and female was 7. Prevalence of TSH in the age group of 20 – 40 was 51.2% out of this male percentage was 7 & female was 44.2. For more than 40 years prevalence was 40% among than the percentage of female was 27.9 and male was 11.6%.

In Gynaecology department Prevalence of thyroid was 6%. In department. Of Paediatric 50% male & 50% female was effected with TSH.

Patients were classified as Hypothyroidism, hyperthyroid, euthyroid. According to thyroid level with TSH normal range .4 – 5.5 uIU/ml hypothyroid of people with TSH level was greater than 5.5 uIU/ml those people who were classified as TSH level less than .4 named hyperthyroid. Free T4 level were not available through the health fair to further subclassified thyroid function regarding subclinical disease.

In range of age group 15-75 male were 20 and female were 38 there are more participants in Euthyroid total 578 in which 438 were female 140 were male in age group of infant to 79 years. This study revealed that hypothyroid effected females were 78 and male 20.

Table-1
Hormonal Status Higher

Gender	TSH	%	T3	%	T4	%
	0.19-6.16 µIU/L		.6-1.85 ng/ml		4.8-11.8 µg/dl	
Male	18	20.5	0	0	0	0
Female	68	77.3	2	2.2	0	0

Table-2
Age (in year)

Gender	under 20	%	20-40	%	more than 40	%
Male	2	2.3	6	7	10	11.6
Female	6	7	38	44.2	24	27.9
Total	8	9.3	44	51.2	34	39.5

Figure-1 Number of subjects and age.

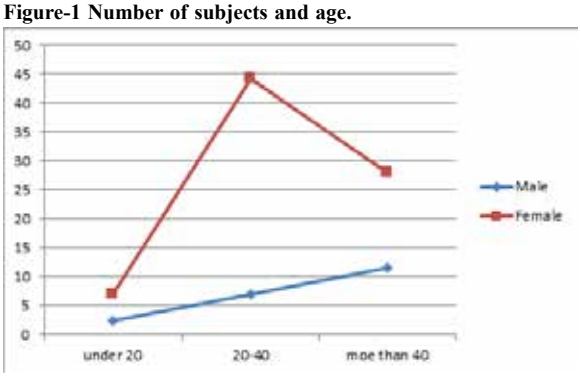

Table-3
Hormonal Status less

Gender	TSH	%	T3	%	T4	%
	0.19-6.16 µIU/L		.6-1.85 ng/ml		4.8-11.8 µg/dl	
Male	4	2	0	0	38	19.4
Female	8	4	0	0	146	74.6

Table-4
OBST. & GYNAE. Department

Not on Thyroid	Thyroid
122 (94%)	8(6%)

Table-5
Pediatrics Department

	Infant %
Male	50
Female	50

Table-6
Serum Thyroid Stimulating Hormone Level

Demographic	Status		
Age	Hyperthyroid TSH <0.4 μIU/ml	Euthyroid TSH .4-5.5 μIU/ml	Hypothyroid TSH >5.5 μIU/ml
Range in Year	15-75	<1-79	<1-85
Gender			
Male	20	140	20
Female	38	438	78

Discussion

In the present study, we assessed the nationwide prevalence of thyroid disorders, particularly hypothyroidism, in adults residing in various urban cities that represent diverse geographical regions of India. Hypothyroidism was found to be a common form of thyroid dysfunction affecting 10.9% of the study population. The prevalence of undetected hypothyroidism was 3.47% i.e., almost one-third of the hypothyroid patients (186 out of 587) were diagnosed for the first time during the course of study-related screening.

The emergence of Kolkata as the worst affected city was unanticipated, particularly as the city was established to be iodine replete over a decade back.[15] However, in a comparable geographical area of Gangetic basin in West Bengal, the prevalence of hypothyroidism in 3814 subjects from all age groups was even higher (29%).[16]

The high prevalence figures in Kolkata have ascertained that thyroid disorders in India are not confined to the conventional iodine-deficient sub-Himalayan zone but also extended to the plain fertile lands. A possible etiological role of cyanogenic foods acting as goitrogens to interfere with iodine nutrition has been previously suggested for, but not limited to this area.[17-18] Increasing exposure to thyroid disruptors including industrial and agricultural contaminants has been identified as a growing health concern throughout India.[19] There was a predominance of thyroid dysfunction in women in our study, and is consistent with worldwide reports, especially those in midlife (46-54 years). Given the association between thyroid disorders and cardiovascular risk factors such as hypertension and dyslipidemia.[20] Firstly, it was done in urban India, and the prevalence of hypothyroidism in rural India remains unknown. Secondly, from the consumption of iodized salt, the study presumed that the target population was iodine sufficient, without testing for reliable markers such as iodine content in salt samples or urinary iodine excretion.[21]High TSH values were more common in females (11.6%) than males (2.9%). TSH values below normal were present in 6.3% of females and 5.5% of males, with values below the limit of detection of the assay present in 1.5% of females and 1.4% of males.[22] The upper limit of 5 mU/L for blood spot TSH is only for the target population of neonates. If we consider an upper limit of 3 mU/L for an adult population, then 35% women and 16% men from the Dang district Gujarat state, on the whole, has mild IDD based on urinary iodine and blood TSH levels in adults.[23] A total of 5376 adult male or non-pregnant female participants ≥18 years of age were enrolled, of which 5360 (mean age: 46 ± 14.68 years; 53.70% females) were evaluated. The overall prevalence of hypothyroidism was 10.95% (n = 587, 95% CI, 10.11-11.78) of which 7.48% (n = 401) patients self reported the condition, whereas 3.47% (n = 186) were previously undetected. Inland cities showed a higher prevalence of hypothyroidism as compared to coastal cities. A significantly higher (P < 0.05) proportion of females vs. males (15.86% vs 5.02%) and older vs. younger (13.11% vs 7.53%), adults were diagnosed with hypothyroidism. Additionally, 8.02% (n = 430) patients were diagnosed to have subclinical hypothyroidism (normal serum free T4 and TSH >5.50 μIU/ml). Anti – TPO antibodies suggesting autoimmunity were detected in 21.85% (n = 1171) patients.[24]

Quality rating scale for water quality parameters (qi) of Moradabad city situated on the right bank of the ram ganga river is chloride <200 as Permissible 100, 200-400 as Slight 80, 401-600 as Moderate 50 and >600 as Severe 0.[25]

Conclusion:-

This study identified that in TMM & RC higher prevalence of TSH was in female patients during 20-40 years particularly it was more among pregnant ladies.

References:-

1. Salvatore D, Davies TF, Schlumberger MJ, Hay ID, Larsen PR. Thyroid Physiology and Diagnostic Evaluation of Patients with Thyroid Disorders. In: Melmed S, Polonsky KS, Larsen PR, Kronenberg HM (Editors). Williams endocrinology. 12th edition. Elsevier Saunders. Philadelphia. 2011; 329-384.
2. Kenneth AW. Update on the Managements of Hyperthyroidism and Hypothyroidism. Arch Intern Med 2000;160(8):1067-71.
3. N Kochupillai. Clinical Endocrinology in India. 2 Current Science 2000, 8: 1061-7.
4. Hueston WJ. Treatment of Hypothyroidism. Am Fam Physician 2001;15;64(10):1717-25.
5. Parle JV, Franklyn JA, Cross KW, Jones SR, Sheppard MC. Circulating lipid and minor abnormalities of thyroid function. Clin Endocrinology 1992;37(5):411-14.
6. Friedman MN. Screening for thyroid disease. Ann Med 1999;130(2):161-62.
7. Glinoer D, Thyroid disease during pregnancy In Werner &Ingbar's The Thyroid: A fundamental and Clinical Text, Ed Braverman LE, Utiger RD, 9th Edn, Lippincott Williams & Wilkins, 2005, 1086-1108
8. Sharbari B, Biswajit M, Sonali S, Satheesh kumar G. Estimation of iodine levels in drinking water in puducherry district. Biomedical Research 2007;18(3):171-73.
9. Hetzel BS. Iodine deficiency disorder (IDD) and their eradication. 1983.2: 1126-1129.5
10. Sheila C Vir. Current Status of Iodine Deficiency Diseases and Strategy for Its control in India Indian J Pediatr 2002: 69 : 589-96
11. Tsegaye B and Ergete W (2003). Histopathologic pattern of thyroid disease. East African Medical Journal 80(10) 525-528.
12. Hetzel B.S.Iodine deficiency disorders (IDD) and their eradication. The Lancet. 1983. 2:1126-1129.5.
13. Pandav CS, Karmarkar MG, Nath LM. National Goitre Control Programme (Iodine Deficiency Disorders Control Programme). National Health Programme series 5, National Institute of Health & Family Welfare, New Delhi, 1988.
14. Henry MK, Shlomo M, Kenneth SP, Larsen PR. Williams Textbook of Endocrinology. 11th ed. USA: Saunder; 2007.p.320
15. Sinha RK, Bhattacharya A, Roy BK, Saha SK, Nandy P, Doloi M, et al. Body iodine status in school children and availability of iodised salt in Calcutta. Indian J Public Health 1999;43:42-8.
16. Chandra AK, Tripathy S, Mukhopathyay S, Lahari D. Studies on endemic goitre and associated iodine deficiency disorders (IDD) in a rural area of the Gangetic West Bengal. Indian J Nutr Diet 2003;40:53-8.
17. Chandra AK, Tripathy S, Lahari D, Mukhopadhyay S. Iodine nutritional status of school children in a rural area of Howrah district in the Gangetic West Bengal. Indian J Physiol Pharmacol 2004;48:219-24.
18. Chandra AK, Mukhopadhyay S, Lahari D, Tripathy S. Goitrogenic content of Indian cyanogenic plant foods and their in vitro anti-thyroidal activity. Indian J Med Res 2004;119:180-5.
19. Kalra S, Unnikrishnan AG, Sahay R. Thyroidology and public health: The challenges ahead. Indian J Endocrinol Metab 2011;15:S73-5.

Volume : 5 | Issue : 8 | August 2016 • ISSN No 2277 - 8179 | IF : 3.508 | IC Value : 69.48

20. Luboshitzky R, Herer P. Cardiovascular risk factors in middle-aged women with subclinical hypothyroidism. Neuro Endocrinol Lett 2004;25:262-6.
21. WHO/UNICEF/ICCIDD. Indicators for assessing Iodine Deficiency Disorders and their control through salt iodization. Geneva, WHO/NUT/94.6. 1994.
22. Parle JV[1], Franklyn JA, Cross KW, Jones SC, Sheppard MC,Prevalence and follow-up of abnormal thyrotrophin (TSH) concentrations in the elderly in the United Kingdom.
23. Sheela R Brahmbhatt1 MSc (Med), Ron Fearnley (Certificate – Technical Officer), Rajesh M Brahmbhatt1 MD, Creswell J Eastman2 MD and Steven C Boyages1 PhD Study of biochemical prevalence indicators for the assessment of iodine deficiency disorders in adults at field conditions in Gujarat (India)
24. Ambika Gopalakrishnan Unnikrishnan, Sanjay Kalra, Rakesh Kumar Sahay,Ganapathi Bantwal, Mathew John, and Neeraj Tewari,Prevalence of hypothyroidism in adults: An epidemiological study in eight cities of India
25. Mohammad Alam and J.K. Pathak, Rapid Assessment of Water Quality Index of Ramganga River, Western Uttar Pradesh (India) Using a Computer Programme