Original article:

Analysis of Thyroid Disorders among Female Patients Visited in a Tertiary Care Centre

Dr. K. B. Shivamurthy

Assistant Professor, Department of General Medicine, Mamata Medical College, Khammam, Andhra Pradesh, India.

Corresponding Author: Dr. K. B. Shivamurthy, Assistant Professor, Department of General Medicine, Mamata Medical College, Khammam, Andhra Pradesh, India.

Date of Submission: 13 December 2009, Date of Acceptance: 09 February 2010

ABSTRACT

Background: Thyroid hormone disorders are the commonest endocrine disorder. Thyroid disorders are classified broadly as hyperthyroidism and hypothyroidism. The present study was conducted to assess the prevalence of thyroid disorders among female patients visited in tertiary care centre.

Materials and Methods: This cross sectional study was conducted among 800 women aged 18–30 years who visited in a tertiary care hospital over the period of 1 year. Demographical variables and blood samples were collected. fT3, fT4 and TSH level were estimated. Data analysis was done by Statistical Package for Social Sciences. Statistical significance was calculated using One-Way ANOVA, Pearson's correlation and p values ≤0.05 (two tailed) were considered significant.

Results: In the present study total female patients were 800 in which 435 females had sub-hypothyroidism, 229 female patients had overt- hypothyroidism, 92 females had Sub-hyperthyroidism, 45 females had Overt- hyperthyroidism. Maximum patients were having Sub-hypothyroidism. In the age group 18-24 years 172 females had sub-hypothyroidism, 142 female patients had overt- hypothyroidism, 34 females had Sub-hyperthyroidism, 17 females had Overt- hyperthyroidism. Maximum patients were having Sub-hypothyroidism in the age group 18-24 years. In the age group 24-30 years 262 females had sub-hypothyroidism, 87 female patients had overt- hypothyroidism, 58 females had Sub-hyperthyroidism, 28 females had Overt-hyperthyroidism. Maximum patients were having Sub-hypothyroidism in the age group 18-24 years.

Conclusion: Our study concluded that maximum females were having Sub-hypothyroidism. Maximum females were having Sub-hypothyroidism in both the age group 18-24 years and 24-30 years.

Key words: Sub-Hypothyroidism, Overt- Hypothyroidism, Sub-Hyperthyroidism, Overt-Hyperthyroidism.

INTRODUCTION

Disorders of thyroid gland are the commonest endocrine disorder in India. With a population of around 1.25 billion, an estimated 42 million people would be suffering from thyroid disorders.[1] Thyroid disorders are classified broadly as hyperthyroidism and hypothyroidism depending on the functional capacity of the thyroid gland.[2] These two entities are further segregated as subclinical and overt dysfunction.[3] Both these disorders are more prevalent in females as compared to males.[4] It is a spectrum of disorders manifesting either as hypo or hyper functioning of the thyroid gland reflected in the circulating levels of Tri-iodothyronin (T3), Thyroxin (T4)

and Thyroid stimulating hormone (TSH). The disorders of thyroid hormone can be due to diseases of the thyroid gland itself (primary), secondary to pituitary disorder (secondary) or due to hypothalamic diseases (tertiary).[5] Thyroid dysfunction increases the risk of osteoporosis, hyperlipidemia, hypercholesterolemia as well as cardiovascular and neuropsychiatric disorders.[6] Increase in serum concentration of Thyroid Stimulating Hormone (TSH) is an early and sensitive indicator of decreased thyroid reserve and in conjunction with decreased free thyroxin (fT4) is diagnostic of primary overt hypothyroidism.[7] The term subclinical hypothyroidism is used to describe patients with elevated TSH concentration but with normal levels of T4 , T3 and fT4.[8] The present study was conducted to assess the prevalence of thyroid disorders among female patients visited in tertiary care centre.

MATERIALS AND METHODS

This cross sectional study was conducted among 800 women aged 18–30 years who visited in a tertiary care hospital over the period of 1 year. Informed consent was taken from the patients. Only those who were willing to give blood samples and patients who visited the hospital with suspected thyroid disorders viz hypothyroidism, hyperthyroidism or for screening of thyroid disorders got their thyroid function test done were included in this study. Demographical variables were collected. fT3, fT4 and TSH level were estimated by Enzyme Linked Immuno Sorbent Assay (ELISA) method. Serum was separated from blood samples and stored at -20°C until analysis. Serum fT3 and fT4 estimation were carried out by competitive ELISA method using commercially supplied reagents (Human, Germany) and concentrations were expressed in pg/ml and ng/dl respectively. Similarly, estimation of serum TSH level was carried out by Sandwich or double antibody coated ELISA method by aforementioned kit and expressed in mU/L. Washing steps were performed in ELISA washer (Erba, Germany) and reading was taken in ELISA reader (Erba, Germany). Patients were diagnosed into different categories according to normal reference range of euthyroid state of the patient as given in the protocol as fT3 (1.4-4.2 pg/ml), fT4 (0.8-2.0 ng/dl) and TSH (0.3-6.2 mU/L). The patients having relevant clinical features with low fT3 and fT4 level and increased TSH level (>15.0 mU/L) are diagnosed as overt hypothyroidism. The subclinical hypothyroid patients are diagnosed as having normal fT3 /fT4 and high TSH level (6.2-15.0 mU/L). Similarly, patients with relevant clinical features having high fT3 /fT4 and low TSH (0.1 mU/L with fT4 at upper limit of normal fT3 /fT4 and low TSH level (<0.1mU/L). The decision level of TSH was taken at two places in scatter diagram one at 10.1-15 mU/L and another at 6.2-10 mU/L with fT4 at lower limit of normal 0.8 ng/dl for hypothyroid patients to see the actual population under appropriate treatment and other whose treatment might be unnoticed due to such value of TSH. Data analysis was done by Statistical Package for Social Sciences. Statistical significance was calculated using One-Way ANOVA, Pearson's correlation and p values ≤ 0.05 (two tailed) were considered significant.

RESULTS

In the present study total female patients were 800 in which 435 females had sub-hypothyroidism, 229 female patients had overt- hypothyroidism, 92 females had Sub-hyperthyroidism, 45 females had Overt-hyperthyroidism. Maximum patients were having Sub-hypothyroidism. In the age group 18-24 years 172

females had sub-hypothyroidism, 142 female patients had overt- hypothyroidism, 34 females had Sub-hyperthyroidism, 17 females had Overt- hyperthyroidism. Maximum patients were having Sub-hypothyroidism in the age group 18-24 years. In the age group 24-30 years 262 females had sub-hypothyroidism, 87 female patients had overt- hypothyroidism, 58 females had Sub-hyperthyroidism, 28 females had Overt-hyperthyroidism. Maximum patients were having Sub-hypothyroidism in the age group 24-30 years.

Table 1: Distribution according to gender

Thyroid disorders	**N**
Sub-hypothyroidism	434
Overt- hypothyroidism	229
Sub-hyperthyroidism	92
Overt- hyperthyroidism	45
TOTAL	800

Table 2: Distribution according to age group

Thyroid disorders	**Age group**	
	18-24	**24-30**
Sub-hypothyroidism	172	262
Overt- hypothyroidism	142	87
Sub-hyperthyroidism	34	58
Overt- hyperthyroidism	17	28
TOTAL	365	435

DISCUSSION

The prevalence of hypothyroidism in developed countries is about 4%–5%.[6] International studies also showed the similar result of higher prevalence of hypothyroidism than hyperthyroidism.[9,10] A study done in India by Khan A also concluded with the higher prevalence of female diagnosed with thyroid dysfunction.[11] The study done by Jha B et al showed that hypothyroidism was seen more in the age group of 71-95 years and hyperthyroidism in 15-44years.[10]

In the present study total female patients were 800 in which 435 females had sub-hypothyroidism, 229 female patients had overt- hypothyroidism, 92 females had Sub-hyperthyroidism, 45 females had Overt-hyperthyroidism. Maximum patients were having Sub-hypothyroidism. In the age group 18-24 years 172 females had sub-hypothyroidism, 142 female patients had overt- hypothyroidism, 34 females had Sub-hyperthyroidism, 17 females had Overt- hyperthyroidism. Maximum patients were having Sub-hypothyroidism in the age group 18-24 years. In the age group 24-30 years 262 females had sub-hypothyroidism, 87 female patients had overt- hypothyroidism, 58 females had Sub-hyperthyroidism, 28 females had Overt-hyperthyroidism. Maximum patients were having Sub-hypothyroidism in the age group 24-30 years.

All women in the reproductive age group (not attained menopause) experienced menstrual abnormalities (irregular cycle, menorrhagia, or intermenstrual bleeding) in this study. The prevalence of menstrual irregularities (mainly oligomenorrhea) as reported by Krassas *et al*. was 23% against 8% in the control population.[12]

Considering the clinical presentation and female preponderance, it becomes very important to screen patients, especially younger females, for hypothyroidism who present with this symptomatology.[13]

The prevalence of thyroid disorders in the reproductive age group of 21-40 years of age was highest shown by Baral N et al.[14]

Among the various varieties of hypothyroidism, congenital hypothyroidism is probably the most important, as it is requires an early diagnosis, which is usually followed by appropriate therapy that can prevent the onset of brain damage. Studies from Mumbai have suggested that congenital hypothyroidism is common in India, the disease occurring in 1 out of 2640 neonates, when compared with the worldwide average value of 1 in 3800 subjects.[15]

Subclinical hypothyroidism is also one of the important conditions affecting maximum population. Although patients have subtle finding, including alteration in lipid metabolism, cardiac, gastrointestinal, neuropsychiatric and reproductive abnormalities and increase likelihood of goiter.[16]

CONCLUSION

Present study concluded that maximum females were having Sub-hypothyroidism. Maximum females were having Sub-hypothyroidism in both the age group 18-24 years and 24-30 years.

REFERENCES

1. Kochupillai N. Clinical Endocrinology in India. Curr Sci. 2000;79:1061–67.
2. Barzel US. Thyroid disease after the sixth decade. Curr ther Endocrinol Metab 1997; 6:134-7.
3. Elte JW, Mudde AH, Kruseman ACN. Subclinical thyroid disease. Postgrad Med J 1996; 72:141-146.
4. Waller DK, Anderson JL, Lorey F, Cunningham GC. Risk factors for congenital hypothyroidism: an investigation of infant's birth weight, ethnicity, and gender in California, 1990–1998. Teratology 2000; 62:36–41.
5. Cooper DS. Clinical practice. Subclinical hypothyroidism. N Engl J Med. 2001;345:260–65.
6. Hollowell JG, Staehling NW, Flanders WD et al. Serum TSH, T4, and thyroid antibodies in the United States population (1988 to 1994): National Health and Nutrition Examination Survey (NHANES III). The Journal of Clinical Endocrinology & Metabolism. 2002;87:489– 99.
7. Becker DV, Biogs ST, Gaitan E, et al. Optimal use of blood tests for assessment of thyroid function. Thyroid 1993; 3:353-54.

8. Wardle CA, Fraser WD, Squire CR. Pitfalls in the use of thyrotropin concentration as a fi rst-line thyroid-function test. Lancet 2001; 357:1013-14.

9. Canaris GJ, Manowitz NR, Mayor G, Ridgway EC. The Colorado Thyroid Disease Prevalence Study. Arch Intern Med. 2000;160:526- 34.

10. Jha B, Gurung C.K, Singh JB, Subedi R.C. A study on thyroid disorders in suspected cases attending Om Hospital and Research Centre during 1996-1998. Journal of the Institute of Medicine. 1999;21:1 –200.

11. Khan A, Khan MMA, Akhtar S. Thyroid Disorders, Etiology and Prevalence. Journal of Medical Sciences.2002; 2:89-94.

12. Krassas GE, Pontikides N, Kaltsas T, Papadopoulou P, Paunkovic J, Paunkovic N, et al. Disturbances of menstruation in hypothyroidism. Clin Endocrinol (Oxf) 1999;50:655-9.

13. Kumar N, Allen KA, Riccardi D, Bercu BB, Cantor A, Minton S, et al. Fatigue, weight gain, lethargy and amenorrhea in breast cancer patients on chemotherapy: Is subclinical hypothyroidism the culprit? Breast Cancer Res Treat 2004;83:149-59.

14. Desai PM. Disorders of the Thyroid Gland in India. Indian J Pediatr 1997;64:11-20

15. Baral N, Lamsal M, Koner BC, et al. Thyroid dysfunc-tion in eastern Nepal. Southeast Asian J Trop Med Public Health 2002;33: 638-41.

16. Mc Dermott MT, Ridgway EC. Subclinical hypothyroidism is mild thyroid failure and should be treated. The Journal of Clinical Endocrinology & Metabolism 2001;86:4585-90.