



HYPOTHYROIDISM AND PSYCHIATRIC DISORDERS IN A TERTIARY CARE HOSPITAL

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ABSTRACT

An abnormality in thyroid hormonal status is common in major psychiatric disorders, although the relationship between thyroid function and mental disease is under emphasized. The main aim of this study was to determine the effectiveness of thyroid function screening in psychiatric patients attending OPD in SKIMS, Medical College Bemina. The study was conducted on 100 patients that were diagnosed

based on the thyroid function tests (TFT). On investigation our result shows that sub-clinical hypothyroidism (26%) was more prevalent than clinical hypothyroidism (6%), these results need to be confirmed by controlled studies in larger patient populations.

KEYWORDS: Hypothyroidism, Psychiatry disorders, Thyroid function.

INTRODUCTION

Thyroid-stimulating hormone (also known as thyrotropin, Thyroid Stimulating Hormone (TSH)) stimulates the thyroid gland to produce thyroxine (T4) and triiodothyronine (T3), which is a metabolism stimulating hormone. TSH is synthesized and secreted by thyrotrope cells in the anterior pituitary gland and regulates the endocrine function of the thyroid gland. Production and secretion of TSH is stimulated by the hypothalamus, which produces thyrotropin-releasing hormone (TRH). Production of TSH is inhibited by somatostatin, which is also produced by the hypothalamus and via a negative feedback loop by T3 and T4.^[1]

The relation between thyroid function and mental disorders has long been recognized. Thyroid disorders, including both hypothyroidism and hyperthyroidism, may be accompanied by various neuropsychiatric manifestations, ranging from depression^[2] and anxiety^[3] to psychosis.^[4] Thyroid diseases may be caused by qualitative or quantitative alterations in hormonal secretion, the increase in size of the gland or both mechanisms. The shortage of thyroid hormones produces hypothyroidism and excessive secretion causes hyperthyroidism. Thyroidism includes disorders with various etiologies characterized by inflammation of the thyroid gland. In hypothyroidism, the patient may present depression with sensory, cognitive and behavioral disturbances.

Subclinical hypothyroidism is the most common condition found by screening using TFT. Five to 10% of adult women have an elevated TSH level.^[5] In an analysis of the U.S. population, the prevalence of subclinical hypothyroidism was reported to be 1.2-5.8% among women and 1.8-3.4% among men. In the Wickham survey, a large, high-quality, population-based study with a 20-year follow-up, the prevalence was 4.0-17.4% among women and 1.0-6.2% among men. In an older subset of the population (greater than 60 years of age), the prevalence was about 1% in men and 1.5% in women.^[6] In another study, the prevalence of thyroid disease among inpatients was approximately 1-2% and was similar to the outpatient population.^[7] Lastly, in a study of adolescents, subclinical hypothyroidism was reported in 1.7% of patients and subclinical hyperthyroidism was reported in 2.3% of patients.^[8]

Taken together, these data demonstrate the unclear relationship between thyroid function and mental diseases. As a result, one important question is whether a physician should screen thyroid functions in psychiatric patients who have no specific indication for thyroid testing. Therefore, the main aim of this preliminary study was to determine the effectiveness of thyroid function screening in psychiatric patients upon hospitalization in Srinagar.

MATERIALS AND METHODS

This cross sectional study was conducted on 100 patients attending psychiatric out patient department (OPD) in the SKIMS medical College, Bemina. Age of patients varied between 15 and 80 years. Informed consents of the patients were obtained during admission to the hospital. Patients were diagnosed according to the Diagnostic and Statistical Manual of Mental Disorders (DSM-IV). TFT was performed on all 100 inpatients. Venous blood samples were drawn for measurements of serum TSH, thyroxin (T4) and triiodothyronine (T3) after an overnight fast. Serum TSH, T4, and T3 levels were analyzed by Ultrasensitive

Sandwich Chemiluminescence Immunoassay. Normal ranges were defined as 0.3-5.5 mIU/ml for serum TSH, 4.5-12.0 ng/dl for T4, and 60-200 ng/dl for T3.

RESULTS

Out of 100 patients included in the study, 43 were males and 57 were females, with study population consisted of patients aged 15–80 years. TFT were performed on all patients attending the psychiatry unit. Of the 100 patients Sub-Clinical Hypothyroidism was observed in 8 patients (30.77%) with Major Depressive Disorder, 4 patients (15.39%) with Schizophrenia, 6 patients (23.07%) with anxiety disorders, 3 patients (11.54%) with Autism Spectrum Disorder, 3 patients (11.54%) with Bipolar Associated Disorder, and 2 patients (7.69%) with Dementia (Table 1). However, Clinical Hypothyroidism was seen in 6 patients (6%) out of 100 patients with Major Depressive Disorder (Table 2).

Table 1: Prevalence of Sub-Clinical Hypothyroidism in Psychiatric Patients

Diagnosis	SubClinical Hypothyroidism	%
Major Depressive Disorder	8	30.77%
Schizophrenia	4	15.39%
Anxiety Disorder	6	23.07%
Autism Spectrum Disorder	3	11.54%
Bipolar Associated Disorder	3	11.54%
Dementia	2	7.69%
Total	26	

Table 2: Prevalence of Clinical Hypothyroidism in Psychiatric Patients.

Diagnosis	Clinical Hypothyroidism	%
Major Depressive Disorder	6	6%

DISCUSSION

From the Table it is evident that depressives have a raised TSH. Raised TSH indicates that the thyroid gland did not work properly in those subjects leading them to sub-clinical or clinical hypothyroidism. The phenomenon may be explained by the changes in the neurotransmitter system. The basic homeostatic mechanism of different hormones, peptide hormones in particular, depend on hypothalamic control via the hypothalamo—hypophyseal portal system which carries hypothalamic factors to the pituitary and thereby controls the pituitary. It has been well documented for the efficacy of TSH a minimum amount of TRH (Thyroid Releasing Hormone) is obligatory. The secretion of T.R.H. is dependent on two

factors namely Dopamine and Serotonin. When there is decrease in dopamine concentration due to greater utilisation via the M.A.O. (Monoamine Oxidase) pathway or through COMT (Catecholamine O Methyl Transferase) pathway TRH becomes less available and as such TSH fails to exert its influence over the thyroid in production of T3, T4. Our results indicated that thyroid abnormalities were present in patients with Major Depressive Disorder, Schizophrenia, Anxiety Disorder, Autism Spectrum Disorder, Bipolar Associated Disorder and Dementia attending tertiary-care general hospital unit. Sub-Clinical Hypothyroidism was more frequent in Major Depressive Disorder as compared to other psychiatric disorders. We further found that sub-clinical hypothyroidism (26%) was more prevalent than clinical hypothyroidism (6%) in psychiatry patients. Similar findings was found in a study of Borax G.C *et al* in 1980⁹, on thyroid function in different psychiatric disorders and he reported that depressive patients had Sub-Clinical Hypothyroidism and Clinical Hypothyroidism and Brouwer J.P *et al* in 2005^[10] reported higher thyroid stimulating hormone (TSH) in depressive patients. We find that sub-clinical hypothyroidism (26%) was more prevalent than clinical hypothyroidism (6%) as reported by Holowell J.P *et al* in 2002^[11] and Chakrabarti *et al* in 2006.^[12] showed that depressive patients have been suffering from sub-clinical hypothyroidism. The limitations of the present study include the small number of inpatients, so these results need to be confirmed by controlled studies in larger patient populations. Also these results may not reflect the prevalence of thyroid dysfunction in psychiatric disorders in general. Additionally, our findings do not reflect whether thyroid dysfunction is a cause or a result of psychiatric disorder and its treatment. Despite these limitations, the study highlighted the fact that abnormal thyroid hormonal status was frequently seen in this patient population. The implication with regard to screening of abnormal thyroid hormonal status and cost-effectiveness in the management of Major Depressive Disorders warrants further study.

CONCLUSION

On the basis of the findings of our study we may conclude that major psychiatric disorders namely major depressive disorders do have demonstrable changes in their thyroid functions. Our study concluded that prevalence of major depressive disorders was 30.77% in Sub-Clinical Hypothyroidism and 6 % in Clinical Hypothyroidism and this is more prevalent than other psychiatric conditions.

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Competing interests: The authors declare that they have no competing interests.

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