

A Cross-Sectional Study of Thyroid Dysfunction Among Patients with Psychiatric Disorders

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Abstract

Objectives: The objective of this study is to evaluate the prevalence of abnormal thyroid hormonal status in patients with psychiatric disorders.

Materials and methods: A descriptive study comprising of 150 subjects above the age of 20 years attending psychiatry outpatient department, SN Medical College (SNMC), Bagalkot, Karnataka, India, was done over a period of six months, after taking institutional ethics committee clearance. The subjects were included in the study after being diagnosed to be suffering from a psychiatric disorder by a consultant psychiatrist based on the International Classification of Diseases-10 (ICD-10) criteria, who gave consent. Their thyroid function tests (TFTs) were done. A semi-structured proforma was used to obtain sociodemographic data like name, age, sex, socioeconomic status, education, occupation, and TFTs. Data was analysed using frequencies and percentages.

Results: 22% of psychiatric disorder patients had some kind of thyroid dysfunction. Among 22%, 16% of patients had subclinical hypothyroidism, 2.7% had overt hypothyroidism and hyperthyroidism, and 0.7% had subclinical hyperthyroidism. Among depressive episode patients, 8% had subclinical hypothyroidism.

Conclusion: Most common thyroid dysfunction in our patients was subclinical hypothyroidism. Most common psychiatric disorder having thyroid dysfunction was depressive disorder. Thus, treating subclinical hypothyroidism may lead to good prognosis of psychiatric disorders, especially the mood disorders.

Keywords: Hypothyroidism • Mood Disorders • Thyroid Hormones • Hyperthyroidism • Depressive episode.

Introduction

The thyroid hormones, thyroxine (T₄) and triiodothyronine (T₃) which regulate the rate of metabolism in the human body, are produced by the thyroid gland after receiving stimulation from the thyroid stimulating hormone (TSH) that is synthesised and secreted by thyrotrope cells from the anterior pituitary gland. The endocrine function of the thyroid gland is controlled by this hormone. Hormones secreted by thyroid play a vital role in neurogenesis and neurodevelopment, i.e. for dendrite proliferation, myelination, and formation of synapses[1].

There is a well-recognised association between thyroid dysfunction and mood disorders. Patients suffering from thyroid dysfunction show a higher prevalence of anxiety and mood disorders [2], and the response to the treatment of depressive episode and bipolar disorders is dependent on thyroid status [3].

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Thyroid hormone augmentation do help in therapeutic efficacy in treatment-resistant depression [4], and also, thyroid hormone receptors are present in limbic structures implicated in mood regulation [5].

Review studies on the psychopathologies associated with hypothyroidism reported high incidences of anxiety disorders (20-33%), major depression (33-50%), cognitive disorders (29%), and delirium and psychosis (5%) [6,7]. The incidence of depression and anxiety disorders is reported to be high during the course of hyperthyroidism [8]. Forman-Hoffman et al. [9]. in the Third National Health and Nutrition Examination Survey (NHANES), a population-based study that examined 6,869 subjects aged 17-39 years found that lower TSH and higher T₄ levels were associated with depression in men. It has been observed that, in women, there was correlation between free thyroxine level (FT₄) and depression [9]. Gulseren et al. [10], used the Hamilton depression and anxiety rating scales to evaluate the presence of anxiety and depression in patients with subclinical and clinical hypothyroidism and hyperthyroidism. Patients with subclinical thyroid dysfunction scored higher for both depression and anxiety, when compared to that of control group, although not as high as those with overt thyroid dysfunction [10].

During our review of literature we found many studies on prevalence of psychiatric disorders in thyroid dysfunctions, but very limited studies on prevalence of thyroid dysfunction in psychiatric disorders especially in Indian population. This study aims at finding the prevalence of thyroid dysfunction in psychiatric disorder patients.

Materials and Methods

This was an observational cross-sectional hospital-based study on 150

patients, conducted in the Department of Psychiatry at SN Medical College (SNMC) in Bagalkot, Karnataka, India during the period from 1st June 2017 to 1st December 2017 after obtaining institutional ethics committee clearance. All the subjects fulfilling the inclusion and exclusion criteria during the study period were included in this study after obtaining their consent. Sample size was calculated using the formula $n \geq z^2 \frac{1-\alpha}{2} \times \frac{p(1-p)}{d^2}$ where p (estimated proportion) is 0.2566 with reference to study done by Rajiv Radhakrishna et al. [11], d (estimation error) is 0.10, (alpha) is 0.05. The minimum sample size calculated was 74, which we extended up to 150 for our study.

Inclusion criteria

Patients visiting the Department of Psychiatry, SNMC after being diagnosed by a consultant psychiatrist.

Exclusion criteria

- Patients below 20 years of age.
- Patients on treatment with lithium.
- Patients not willing to give consent.
- Patients not willing to undergo TFT.

Study procedure

Subjects above the age of 20 years attending psychiatry outpatient department, SNMC, over a period of six months, were included in the study after being diagnosed to be suffering from a psychiatric disorder by a consultant psychiatrist based on International Classification of Diseases-10 (ICD-10) criteria [12], who gave consent for the study. Their TFTs were done. A semi-structured proforma was used to obtain sociodemographic data like name, age, sex, socioeconomic status, education, occupation, and their TFTs.

Data analysis

Data was entered in Microsoft Excel and analysed by using Statistical Package for the Social Sciences version 22 (SPSS v22). Descriptive statistics were represented with frequencies and percentages.

Results

A total of 150 patients were included in the study. Table 1 shows the sociodemographic profile of the patients 64% were of age group of 21-40 years. Thirty six percent were males and 64% were females. Most of the patients belonged to middle class.

Table 2 shows the diagnosis-wise distribution of the sample and rates of thyroid dysfunction. 22% of psychiatric disorder patients had some kind of thyroid dysfunction. Of them, 16% of patients had subclinical hypothyroidism, 2.7% had overt hypothyroidism and hyperthyroidism, and 0.7% had subclinical hyperthyroidism. Most common thyroid dysfunction found in our sample of psychiatric disorder patients was subclinical hypothyroidism. Among depressive episode patients, eight percent had subclinical hypothyroidism. Only 2.7% of

Table 1: Sociodemographic characteristics of study participants (N=150)

Sociodemographic Characteristics	Frequency	Percent (%)
Age (years)		
21-40	96	64
41-60	49	32.7
>60	5	3.3
Gender		
Male	54	36
Female	96	64
Socioeconomic status		
Low	21	14
Lower middle	68	45.3
Upper middle	52	34.7
Upper	9	6
Education		
No formal education	10	6.7
Primary	12	8
Secondary	16	10.7
Higher secondary	54	36
Graduate	54	36
Postgraduate	4	2.7
Occupation		
Professional	12	8
Skilled	39	26
Farmer	7	4.7
Not working	60	40
Student	15	10
Semi-skilled	17	11.3
Marital status		
Married	105	70
Unmarried	45	30

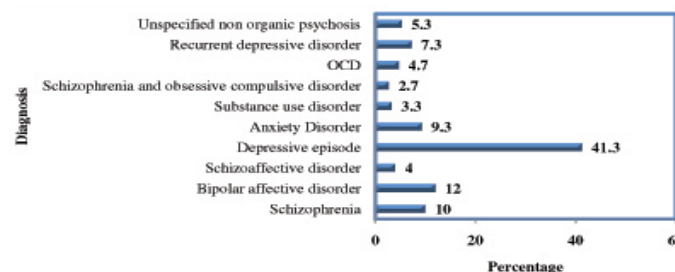


Figure 1: shows the percentage of patients according to diagnosis which shows that in our sample depressive episode was the most common diagnosis that is 41.3%.

Table 2: Diagnosis-wise distribution of the sample and rates of thyroid dysfunction

Diagnosis	Thyroid function levels					Total
	Normal	Clinical hypothyroidism	Subclinical hypothyroidism	Clinical hyperthyroidism	Subclinical hyperthyroidism	
Schizophrenia	11(7.3%)	0 (0.0%)	4 (2.7%)	0 (0.0%)	0 (0.0%)	15 (10.0%)
Bipolar affective disorder	13(8.7%)	1 (0.7%)	2 (1.3%)	1 (0.7%)	1 (0.7%)	18 (12.0%)
Bipolar affective disorder	13(8.7%)	1 (0.7%)	2 (1.3%)	1 (0.7%)	1 (0.7%)	18 (12.0%)
Schizoaffective disorder	6 (4.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	6 (4.0%)
Depressive episode	44 (29.3%)	3 (2.0%)	12 (8.0%)	3 (2.0%)	0 (0.0%)	62 (41.3%)
Anxiety disorder	13 (8.7%)	0 (0.0%)	1 (0.7%)	0 (0.0%)	0 (0.0%)	14 (9.3%)
Substance use disorder	5 (3.3%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	5 (3.3%)
Schizophrenia and Obsessive compulsive disorder	4 (2.7%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	4 (2.7%)
Obsessive compulsive disorder	6 (4.0%)	0 (0.0%)	1 (0.7%)	0 (0.0%)	0 (0.0%)	7 (4.7%)
Recurrent depressive disorder	10 (6.7%)	0 (0.0%)	1 (0.7%)	0 (0.0%)	0 (0.0%)	11 (7.3%)
Unspecified non organic psychosis	5 (3.3%)	0 (0.0%)	3 (2.0%)	0 (0.0%)	0 (0.0%)	8 (5.3%)
Total	117 (78.0%)	4 (2.7%)	24 (16.0%)	4 (2.7%)	1 (0.7%)	150 (100.0%)

schizophrenia patients, 3.3% of bipolar disorder patients, and 0.7% of anxiety disorder patients had some kind of thyroid dysfunction respectively. None of the substance abuse disorder patients of our study had thyroid dysfunction.

Discussion

Our results indicated that thyroid dysfunction were present in patients with mood disorders most commonly. In our study a total of 22% of psychiatric disorder patients had some kind of thyroid dysfunction, that is much in accordance to an Indian study by Rajiv Radhakrishna et al. [11], in which it was 25%. Among 22%, 16% of patients had subclinical hypothyroidism, 2.7% had overt hypo- and hyperthyroidism and 0.7% had subclinical hyperthyroidism. Most common thyroid dysfunction found in our sample of psychiatric disorder patients was subclinical hypothyroidism.

Among depressive episode patients, eight percent had subclinical hypothyroidism and most of the previous studies have shown a possible association between subclinical hypothyroidism and depressive disorders. Studies have also shown that in subclinical hypothyroidism, the response to antidepressant therapy is unsatisfactory and that administration of T3 or TSH increased the response to antidepressants [13]. Our study found most common psychiatric disorder having thyroid dysfunction to be depressive episode when compared to Krishna Bannad et al. [14], who found schizophrenia and schizophrenia spectrum disorder patients most commonly had thyroid dysfunction. 3.4% of bipolar disorder patients had some kind of thyroid dysfunction which is much less compared to that shown by Rajiv Radhakrishna et al [11]. (25.41%), by Bartalena et al [15], (32%), to Cassidy et al [16]. (11.51%). Only 2.7% of schizophrenia patients had thyroid dysfunction which was again much less compared to that shown by Rajiv Radhakrishna et al [11]. (29.3%), Krishna Bannad et al [14]. (64.7%) and K Sim et al [17]. (36.4%).

0.7% of anxiety disorder patients had some kind of thyroid dysfunction which is much slightly higher when compared to that shown by Rajiv Radhakrishna et al [11]. (0.4%). None of the substance abuse disorder patients of our study had thyroid dysfunction.

Limitations

The limitations of our study are that ours was a small sample size and thus, the results cannot be generalised. There was lack of data on medication status of the patients and other comorbidities. Additionally, our finding does not reflect causality, i.e. the thyroid dysfunction is a cause or due to psychiatric disorder and its treatment.

Conclusion

Most common thyroid dysfunction in our patients was subclinical hypothyroidism. Most common psychiatric disorder having thyroid dysfunction was depressive episode. Thus, treating subclinical hypothyroidism may lead to good prognosis of psychiatric disorders, especially the mood disorders.

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