

Association of Psychiatric Disorders with Thyroid Dysfunction

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ABSTRACT

Background: Association of psychiatric disorders with thyroid dysfunction has been reported over the years. With rise in incidence of psychiatric disorders, association becomes important.

Materials and Methods: This was a retrospective study. Thyroid function tests were done in psychiatric patients presenting to our institution over a period of one year and their patterns studied.

Results: A total of 289 patients were studied of whom 103 i.e. 35.6% had abnormal thyroid function tests. The main psychiatric diagnoses were schizophrenia, bipolar disorders and major depressive disease, and of this abnormal thyroid function was seen in 43%, 49% and 33% patients respectively.

Conclusion: A high rate of thyroid dysfunction was seen in psychiatric patients. Larger prospective studies are required to establish the relationship. Before putting the patient on anti-psychotic therapy, thyroid profile should be evaluated.

Keywords: Thyroid Dysfunction, Psychiatric Disorders, Thyroid Function Tests.

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Article History:

Received: 21-05-2017, Revised: 08-06-2017, Accepted: 29-06-2017

Access this article online

Website: www.ijmrp.com	Quick Response code 
DOI: 10.21276/ijmrp.2017.3.4.044	

INTRODUCTION

Over the years an association between psychiatric disorders and abnormal thyroid function has been shown. With the rise in incidence of psychiatric disorders, this association becomes even more significant. Depression among people has risen sharply and has been labelled as fourth most urgent health problem worldwide by World Health Organisation. It has been projected to become the second largest killer after heart disease by 2020 and also the second leading cause of disability associated life years (DALYS).^{1,2} Besides depression other significant psychiatric disorders include schizophrenia and bipolar disorders.

The association of abnormal thyroid function and psychiatric disorders has been recognised for many years now. The impact of thyroid dysfunction on developing brain has been known too well and of late the impact on developed nervous system has also become evident. Studies of hypothalamo-pituitary-thyroid axis in psychiatric patients are available which show an association between the two.^{3,4} It has been observed that improvement in psychiatric symptoms occurs once the thyroid dysfunction is treated.⁵ Association between non-thyroidal illness and psychiatric symptoms has also been suggested.⁶

In present study thyroid function tests in psychiatric patients were studied with the aim to assess any association between psychiatric disorders and thyroid function tests.

MATERIAL AND METHODS

This was a retrospective study conducted at Shri Mahant Indresh Hospital, associated hospital of Shri Guru ram Rai Institute of Medical and Health Sciences, Dehradun which is a tertiary care centre. Patients attending psychiatry department during the period of one year i.e. 1st Jan 2014 to 31st Dec 2014 who had thyroid function tests done were included. Patients with severe morbidity, significant co-morbid illness, pregnant/lactating women and patients on drugs which could affect thyroid function tests were excluded from the study. Serum levels of fT3, fT4 and TSH levels were assessed. The assay was done by CLIA (Chemiluminescence) method using Vitros ECIQ. The data were analysed by SPSS 18.

RESULTS

In all 289 patients were studied. Of these 141 were male and 148 were female. The age varied from 16 to 65 years and the mean age was 36.14±14.45 years. The distribution of psychiatric disorders is given in figure 1. The main psychiatric diagnoses were schizophrenia (75), bipolar disorder (71), major depressive disease (42). Thyroid abnormality was seen in 103 (35.6%) patients. The occurrence of thyroid dysfunction in various psychiatric disorders is shown in Table 1. Amongst patients of

schizophrenia (75), thyroid dysfunction was seen in 32 patients (43%). Of the 71 patients of bipolar disorder, 35 (49%) had abnormal thyroid function. Major depressive disease was

diagnosed in 42 patients of whom 14 (33%) had abnormal thyroid function. There were 31 patients of substance abuse. Only 5 (16%) of these had abnormal thyroid dysfunction.

Figure 1: Distribution of Psychiatric disorders

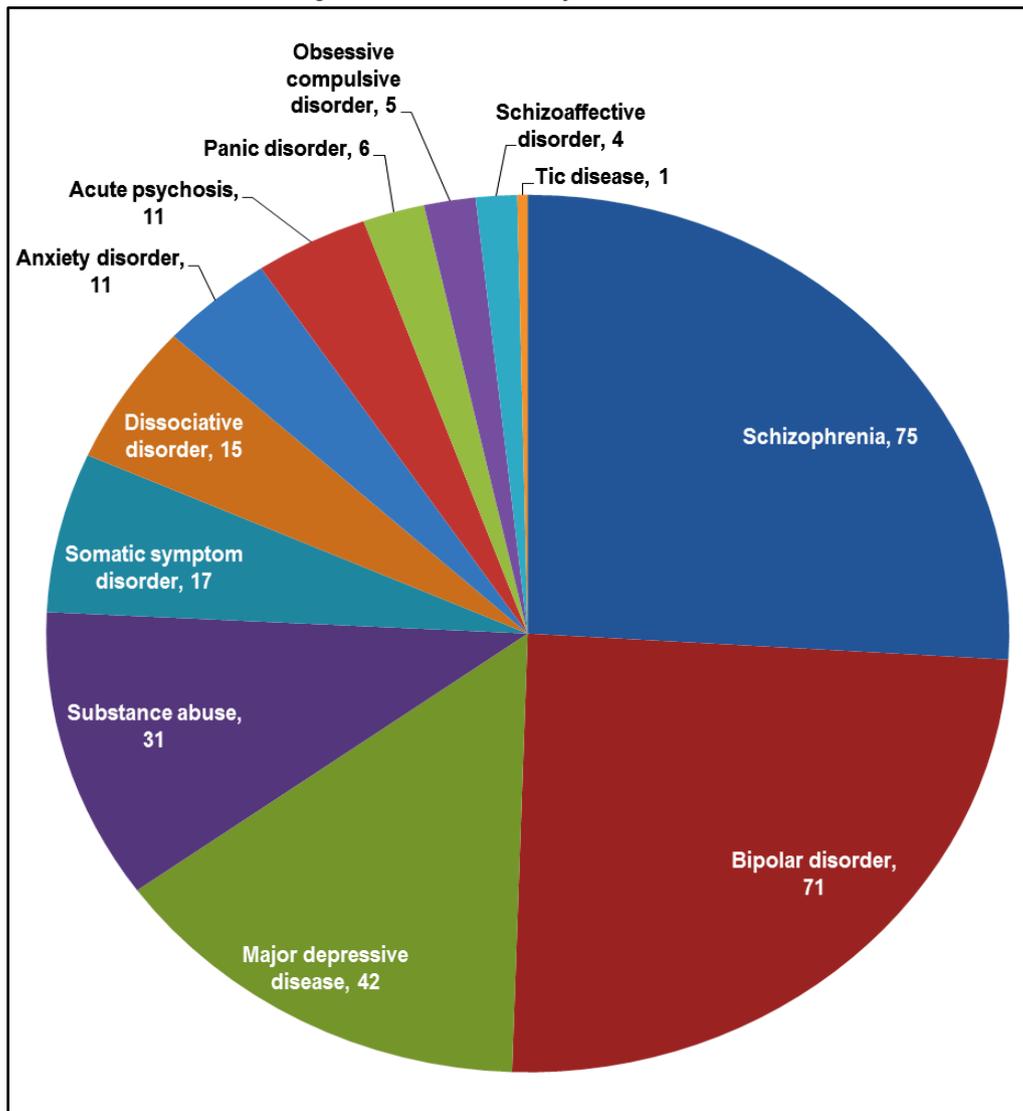


Table 1: Occurrence of thyroid dysfunction in various psychiatric disorders

Disorder	Normal thyroid function	Abnormal thyroid function	Total number of patients	% age patients with thyroid dysfunction
Schizophrenia	43	32	75	42.7
Bipolar disorder	36	35	71	49.3
Major depressive disease	28	14	42	33.3
Substance abuse	26	5	31	16.1
Somatic symptom disorder	12	5	17	29.4
Dissociative disorder	12	3	15	20
Anxiety disorder	8	3	11	27.3
Acute psychosis	8	3	11	27.3
Panic disorder	5	1	6	16.7
Obsessive compulsive disorder	4	1	5	20
Schizoaffective disorder	3	1	4	25
Tic disease	1	0	1	0
Total	186	103	289	35.6

DISCUSSION

Psychiatric disorders are increasing rapidly world over. The association of thyroid dysfunction and psychiatric disorders has been observed over the years. The effect of thyroid dysfunction and psychiatric disorders on developing nervous system is well known and lately the effect of thyroid dysfunction on mature brain has also been evident.

In this study, overall 35.6% of patients having psychiatric disorder had abnormal thyroid function. Radhakrishnan et al found abnormal thyroid hormone status in 25.66% patients of psychiatric disease they studied.⁷

In patients diagnosed with schizophrenia, 42.5% patients had abnormal thyroid function. In a study by Sim K et al 36.4% schizophrenics had abnormal thyroid function while Radhakrishnan et al reported thyroid derangement in 29.3% schizophrenics.^{7,8} Auto-immune thyroiditis has been seen in 14.86% of schizophrenics in a study by Poyraz et al.⁹

There were 71 patients of bipolar disorder in our study of whom 49.3% had deranged thyroid function. This is higher than what has been observed by Bartalena et al (32%), Radhakrishnan et al (25.41%) and Cassidy et al (11.51%).^{7,10,11} Chakraborti S found hypothyroidism either overt or subclinical as most common abnormality in patients with bipolar disorders. The prevalence of thyroid dysfunction is greater among patients with rapid cycling and other refractory disorders.

Of the 42 patients who had depression 33.3% had associated thyroid dysfunction. Depression was higher in subjects with clinical hypothyroidism. It is consistent with finding of Thapa et al where 56% of patients with depression had subclinical hypothyroidism.¹² Major depressive disorder has been seen to be associated significant changes in hypothalamic-pituitary-thyroid axis.² In a study by Jain et al 20% of depressed patients had hypothyroidism, while 36.67% patients diagnosed with hypothyroidism had depression.¹³ In their study subclinical hypothyroidism (13.3%) was more prevalent than clinical hypothyroidism (6.7%). Brower et al also reported higher thyroid stimulating hormone in depressed patients.¹⁴ Chakrabarti et al also showed depression in patients with subclinical hypothyroidism.³ Kirkegaard C et al studied the role of thyroid hormone in depression and suggested adding of T3 to TCA in refractory depression which is equal to adding lithium according to their study.⁵

Santos et al in their study of relationship between thyroid function and schizophrenia and Chakraborti S in his study of thyroid function in patients of bipolar disorder have discussed in detail the interactions between thyroid hormones and nervous system.^{3,4} Thyroid hormones have been shown to affect important neurotransmitters within nervous system. These include dopamine, serotonin, glutamate and GABA. Alterations in these neurochemicals are known to lead to psychiatric symptoms. Thyroid hormone abnormality also affects myelination, oligodendrocyte function and cytokine expression which in turn are thought to cause psychiatric disorders. Possibility of thyroid hormones themselves acting as neurotransmitters has also been suggested and consequently their abnormality would manifest clinically as psychiatric disorder.

Neuroimaging studies such as PET, SPECT and MRI have shown changes in metabolic activity in areas of brain that affect mood and cognition in patients with thyroid disorders.¹⁵ Structural changes related to myelin have also been observed. These

changes revert with treatment of thyroid disorder though in some cases the defects may persist.

Treatment of thyroid disorder has been shown to lead to improvement in psychiatric patients. Augmentation of psychiatric treatment with thyroid hormones has been shown to be beneficial for these patients. In some cases giving thyroid treatment only has resulted in improvement.

Thyroid disease in itself is known to cause psychiatric symptoms which include depression, cognitive defects, anxiety, restlessness, emotional lability and impaired concentration.

Heinrich et al have reported psychosis in a 73 years old lady with abnormal thyroid function tests. She responded to thyroid replacement therapy.¹⁶ Witthauer et al have shown association of specific phobias with thyroid disorder.¹⁷

Dickenson and Barnhill have suggested that abnormal thyroid function tests seen in psychiatric patients are due to nonthyroidal illness. They have observed improvement in thyroid function tests with treatment of psychiatric disorders and recommended that thyroid therapy should not be given.⁶

CONCLUSIONS

A high rate of thyroid dysfunction was observed in psychiatric patients in our study. To establish or refute a causal relationship between the two, large prospective studies need to be done. This will have implications for the clinical management of these patients and given the rising incidence of psychiatric disorders are imminently required. It is recommended that before putting any patient on anti-psychotic therapy, thyroid profile should be evaluated.

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Source of Support: Nil.

Conflict of Interest: None Declared.

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Cite this article as: Sumita Sharma, Kiran Bhat, Sumit Khatri, Rajeev Kushwaha. Association of Psychiatric Disorders with Thyroid Dysfunction. *Int J Med Res Prof*. 2017; 3(4):202-05. DOI:10.21276/ijmrp.2017.3.4.044