

Association of Thyroid Dysfunction with Mood Disorders in an OPD setting

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Abstract

Background And Objectives: Thyroid dysfunction is common among patients with mood disorders. The main purpose of this study is to estimate the prevalence of thyroid dysfunction among patients with various types of mood disorders.

Materials and Methods: The study compromised of 50 patients meeting the inclusion and exclusion criteria selected by simple random sampling technique who attended the psychiatry OPD at B P Koirala Institute Of Health Sciences Dharan, Nepal. These patients were classified into different types of mood disorders according to ICD-10 DCR Criteria. Nineteen patients (38%) were diagnosed BPAD, fourteen patients (28%) as Depressive Disorder and the rest as single episode mania, Recurrent depressive disorder and dysthymia.

Results: Out Of a total 50 cases, Fifteen Patients(30%) were found to have some form of thyroid dysfunction, the most common being subclinical hypothyroidism seen in 22% and the rest 8% with overt hypo/hyperthyroidism cases. This data is clearly /significant higher than the general population. However, there was no significant association found between socio-demographic variables and mood disorders with thyroid dysfunction.

Conclusions: This study shows that thyroid dysfunction is common among patients with mood disorders though larger studies in the community setting are required for further evaluation

Keywords: Mood disorders, ICD -10 DCR Criteria, thyroid dysfunction

INTRODUCTION

Thyroid dysfunction has been associated with mood disorders. Psychiatric syndromes associated with endocrine dysfunction include mood disturbances, anxiety, cognitive dysfunction, dementia, delirium and psychosis.¹ It is now clear that the thyroid hormones play a major role in the functioning and regulation of the neural tissue activity. Hence, it follows that any derangement in the synthesis, secretion, action and peripheral metabolism of thyroid hormones affects the normal functioning of neural tissue, the symptoms of which may manifest as psychiatric syndromes.² Thyroid hormones have profound effects on mood and behaviour, and seem to be able to modulate the phenotypic expression of major affective illness.² Disturbances of affect and mood, such as major depression and bipolar affective disorder, are

associated with disturbances of peripheral thyroid hormone metabolism.³ Most of the studies have been limited to depression alone or Bipolar affective disorder alone.

Depression is a major problem. It is estimated that 20% to 26% of woman and 8 to 12% of men suffer from a major depression during their life time.⁴ There are plenty of evidences that hypothyroidism can produce symptoms and signs that come to the attentions of the psychiatrists as depression, dysthymia or lethargy. However hypothyroidism is not all or none phenomenon.⁵ Depressive affect has been reported to be frequent association with hypothyroidism.⁶ The most common abnormality in thyroid function testing among patients with depression is a mild elevation in serum thyroxine concentration, which falls with clinical response to treatment.⁶ The general idea is that overt hypothyroidism can cause psychiatric diseases like

depression, although in patients with depression, the incidence of overt thyroid dysfunction is low.⁷ This study concluded that thyroid dysfunction is common in depressed patients the most common being sub-clinical hypothyroidism.⁸ Prevalence of depressive symptoms is close to 50% in people with hypothyroidism.⁹ The prevalence of clinical hypothyroidism in psychiatric patients ranges from 0.5% to 8%.¹⁰

A hospital based study in tertiary care hospital in Nepal found a high prevalence of depression and anxiety among hospitalized geriatric medical inpatients as compared to the healthy community dwellers in Nepal.¹¹ In a hospital based retrospective study, Aryal et al showed 25% prevalence of thyroid disorders indicating that one in four patients attending OPD has some degree of thyroid dysfunction; 8% overt hypothyroidism, 8% subclinical hypothyroidism, 3% hyperthyroidism and 6% subclinical hyperthyroidism.¹² Another study done in BPKIHS found out that the prevalence of subclinical hypothyroidism amongst the suspected cases was 20.42% which is much higher compared to other parts of the world.¹³ A similar study carried out to find out the thyroid levels in depressed patients concluded towards presence of thyroid dysfunction among the depressive which most often characterizes as a "Lower thyroid Syndrome".¹⁴

It has been suggested that of all the endocrine systems thought to be linked to the pathophysiology of bipolar affective disorder, the hypothalamic-pituitary-thyroid axis is the prime candidate.³ Thus, it has been assumed that bipolar affective disorder may be associated with alterations in thyroid function and hence the need for a comprehensive thyroid assessment is important for assessing clinical and sub-clinical imbalances linked to a variety of mood disorders like bipolar affective disorder.¹⁵

The lifetime prevalence of bipolar affective disorder is 1.3-1.6% with mortality rates being 2-3 times higher than that of the general population. This study aims to find out the prevalence of thyroid dysfunction among patients with mood disorders based on ICD 10 -DRC and to find the correlation between the two in the OPD setting of B P Koirala Institute Of Health Sciences, Dharan, Nepal.

MATERIAL AND METHODS:

This was a cross sectional study conducted within a period of two months from June to August

2013. The study population comprised of 50 patients selected by simple random sampling technique who attended the Psychiatry OPD of BPKIHS and were diagnosed to have some form of mood disorder. Informed consent was taken from the patients. Approval for the study was taken from the ethical committee of the institutional review board.

The exclusion criteria included known cases of thyroid disease in the past, and who developed thyroid dysfunction when under treatment. Patients with Thyroid Function Test (TFT) reports from BPKIHS central laboratory only were included to avoid bias. A self designed semi structured proforma was devised to obtain the socio demographic characteristics of the study population. All the cases were worked up in detail and diagnosis was made by the consultant Psychiatrist in the OPD.

Blood samples were taken in the fasting state and T3 and T4 were estimated by competitive solid phase Enzyme linked immunosorbent assay (ELISA) whereas TSH by sandwich ELISA employing monoclonal antibodies.

The normal value of free T3 range between 4.0 -8.3 pg/ml, free T4 range between 9-20.0 pg/ml and of TSH range between 0.25 -5.00 microunits/ml was taken in the BPKIHS Biochemistry laboratory. Any values beyond this were considered abnormal and the values of T3, T4 and TSH were seen together to come to a clinical diagnosis of normal or abnormal thyroid status. Subclinical hypothyroidism was defined as normal free T3, normal free T4, and elevated TSH. Subclinical hyperthyroidism was defined as normal free T3, normal free T4 and low TSH. Overt hypothyroidism was defined as decreased free T3, decreased free T4, and elevated TSH and overt hyperthyroidism was defined as elevated free T3, elevated free T4 and low TSH.

Data were analyzed using SPSS version 17. Descriptive analysis was performed and mean, median, range were calculated. The data were explained as mean \pm standard deviation (SD) wherever suitable. Pearson chi-square test was applied for categorical data. P -value of <0.05 was considered significant.

RESULT:

A. Socio-Demographic profile:

Mean age of patients was 33.76 \pm 11.28 ranging between 16-56 years age. Twenty seven (54%) of the total sample were females. Majority of the patients were Hindu, 44 (88%). The proportion of patients who were illiterate and

those educated upto primary , secondary ,higher and above were 8 (16%) ,8 (16%) , 18 (36%) ,16(32%) respectively. Most of the patients were married 37(74%). Roughly one in three were housewives (38%), about one fourth were students (24%). Most of the patients lived in Joint family 25, (50%). (See Table 1)

TABLE 1. shows the socio-demographic variables between patients with and without normal thyroid status

Variables	Thyroid status		P value
	Normal (N=35)	Abnormal (N=15)	
Mean age \pm SD in years	32.8 \pm 11.23	36.00 \pm 11.45	.33
Sex			.23
Male	18	5	
Female	17	10	
Educational status			.31
Illiterate	4	4	
Primary	6	2	
Secondary	15	3	
Higher and above	10	6	
Marital status			.43
Single	8	5	
Married	27	10	
Religion			.25
Hindu	32	12	
Others	3	3	
Occupation			.91
Unemployed	4	2	
Housewife	13	6	
Agriculture	6	1	
Student	8	4	
Others	4	2	
Family type			.38
Nuclear	13	4	
Joint	18	7	
Extended	4	4	

P Value not significant

B. Types of mood disorders

Majority of the patients interviewed were diagnosed as suffering from Bipolar Affective Disorder (BPAD) (38%) ,while another major chunk was diagnosed to be suffering from Depressive Episode (28%) and the rest (34%),were diagnosed as other mood disorders (Mania ,RDD , Dysthmia) (see Table 2)

TABLE 2. Types of mood disorders and the frequency of patients in each types

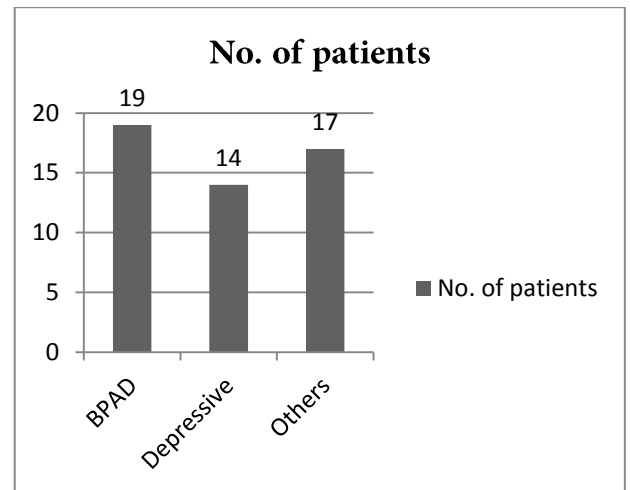


Figure 1 Bar diagram representing distribution of patients according to diagnosis

C. Lab Data-Thyroid status-Seventy percent of the patients had normal thyroid function tests: while 22% had subclinical hypothyroidism, 6 % had overt hypothyroidism, and a single patient (2%) with overt hyperthyroidism. Thus, 30% of patients had thyroid disorders associated with some form of mood disorder. (See Table 3)

TABLE 3. Distribution of patients on the basis of thyroid status

Status of thyroid	N (%)
Normal	35(70)
Subclinical hypothyroidism	11(22)
Overt hypothyroidism	3(6)
Overt hyperthyroidism	1(2)
Total	50(100)

D. Relationship between mood disorders and thyroid dysfunction

The most common thyroid dysfunction among the mood disorder was found to be subclinical hypothyroidism but the P value is .742(>.05) so there does not seem to be any significant association between mood disorders and Subclinical thyroid dysfunction.

TABLE 4. Distribution of thyroid status according to psychiatric diagnosis.

Thyroid status	Psychiatric diagnosis			Total
	BPAD	Depression	others	
Normal	14	8	13	35
Subclinical hypothyroidism	4	4	3	11
Overt hypothyroidism	1	1	1	3
Overt hyperthyroidism	0	1	0	1
Total	19	14	17	50

DISCUSSION:

Only a few studies have been done in our part to find the thyroid levels in depressive patients. There are plenty of evidences that hypothyroidism can produce symptoms and signs that comes to the attention of the psychiatrists as depression, dysthymia or lethargy.⁵ The most common abnormality in thyroid function testing among

patients with depression is a mild elevation in serum thyroxine concentration, which falls with clinical response to treatment.⁶

In accord to the literature it is safe to assume that thyroid profile study can be carried out in patients with suspected mood disorders . This is supported by the fact that administration of adjunctive supra physiological doses of levothyroxine have been found to be an effective treatment option for refractory bipolar affective disorder ¹⁶.

A cross sectional study conducted by Vinay NK et al. concluded that a statistically significant association exists between elevated T3 hormone and bipolar affective disorder and observes that the patients with bipolar affective disorder are 2.55 times more commonly associated with thyroid dysfunction.¹⁷

There are contradictory findings in other studies where the vast majority of patients with depression do not have biochemical evidence of thyroid dysfunction.^{18,19} Das et al. concluded towards presence of thyroid dysfunction among the depressiveness which most often characterized as a “lower thyroid Syndrome”.¹⁴ They had 31 clinically diagnosed depressed patient and equal number of healthy ,age and sex matched control subjects included in the study. Our study included 14 depressed patients with 6 of them having thyroid dysfunction with subclinical hypothyroidism being the most common (about 30%).

Ojha et al. in a study of 70 first time diagnosed depressed patients found 15 (21%) subjects to have thyroid dysfunction, the most common being subclinical hypothyroidism (15%).⁸ The study also showed a positive correlation between thyroid dysfunction with disease severity. Our study, among depressed patients found out that 42.8 % were having some form of thyroid dysfunction with 28.5 % having subclinical hypothyroidism . Both the studies have found out that subclinical hypothyroidism is the commonest , though Ojha et al. have a higher sampling of patients and measurement of correlation between thyroid dysfunction and disease severity was also done in the study.

Rohil V et al. concluded that the prevalence of subclinical hypothyroidism amongst the suspected cases was 20.42 %,in eastern Nepal, which is much higher compared to other parts of the world. Such high prevalence may be due to certain geographical factor mostly hilly areas and dietary inclusion

contributing to the high prevalence of hypothyroidism.

A Greek study concluded, in accord with the literature, that overt thyroid dysfunction is not common in depressive patients and that no significant differences can be traced concerning the thyroid function different clinical subtypes of depression nor there is any correlation between specific clinical symptoms and indices.⁹

Fuller-Thomson et al. conducted a community Health survey of 67,621 subjects and determine the gender-specific prevalence of depression among those with and without thyroid disorders and found that women with thyroid disorders are more vulnerable to depression.¹⁰

Though no larger community scale studies have been carried out in this part of the world, short retrospective and OPD based studies conducted conclude that among the patients with depression, subclinical hypothyroidism is the most common thyroid abnormality.

In accordance with the literature review we can ascertain that the relation between thyroid dysfunction and depression is not clear and further large scale studies are necessary to come to a definitive solution.

Thyroid study is commonly done for depressive patients and usually thyroid replacement has been instituted as a therapy for depressive patients. This can seem logical in our part of South Asia due to the high prevalence of Thyroid dysfunction than other parts of the world. This could be explained clearly more if the studies were done in a larger community field.

A large nationwide Taiwanese study of 21,574 hyperthyroidism patients and the comparison cohort study by Li-Yu Hu et al. found out that patients with hyperthyroidism are at an elevated risk of developing bipolar illness. In addition, women with hyperthyroidism had a greater risk of developing bipolar disorders than men with hyperthyroidism. Furthermore, alcohol use disorders and asthma may be risk factors for developing bipolar disorders in patients with hyperthyroidism.²⁰

Though our study included 19 BPAD patients, the commonest clinical thyroid dysfunction was found to be subclinical hypothyroidism, though we did not find any cases of hyperthyroidism. We could not establish a statistically significant relation

between elevated T3 hormone and bipolar affective disorder, in contrast to the above two studies. To the best of our knowledge in our country no any study relating to the significance between thyroid dysfunction and BPAD has been done, let far any community based study.

Our study is a very small effort to understand this vast yet undecided relation between thyroid dysfunction and mood disorders. Though no statistically significance relation existed between mood disorders and thyroid dysfunction, we could clearly conclude that the patients visiting the Psychiatry OPD had higher incidence of subclinical hypothyroidism.

LIMITATIONS

We acknowledge that our study was a cross-sectional study and consisted of relatively small sample size. Moreover this was a single hospital based study focused on out patients of Psychiatry OPD. So the findings cannot be generalized to the general population.

CONCLUSIONS

A higher association of thyroid dysfunction was noted among patients with mood disorders than the general prevalence of thyroid dysfunction. Larger community based study are recommended to come to a definitive conclusion.

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