

Association of Thyroid Dysfunction with Depression in a Teaching Hospital

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ABSTRACT

Background: Thyroid dysfunction is common in patients with depression and depression is also common in patients with thyroid dysfunction. The purpose of this study was to estimate the prevalence of thyroid dysfunction in newly diagnosed depressed patients attending Psychiatry outpatient department of Tribhuvan University Teaching Hospital, Nepal and to find the correlation between the two.

Methods: The study population comprised of 70 patients aged more than 15 years selected by simple random sampling technique who attended the Psychiatry OPD of Tribhuvan University Teaching Hospital, Kathmandu, Nepal and were diagnosed with first episode depression. A self- designed semi structured proforma was devised to obtain the socio- demographic characteristics of the study population. These patients were diagnosed as depression as per the ICD-10 DCR Criteria and HDRS scale was used at the same interview to verify it objectively.

Results: Fifteen patients (21%) were found to have thyroid dysfunction, the most common being sub-clinical hypothyroidism, seen in 8 (11%). Thyroid dysfunction also showed positive correlation with depression severity. The diagnosis of depression by ICD- 10 DCR Criteria had positive correlation with HDRS grading of depression, though no significant association was found between different socio- demographic variables and depression.

Conclusions: This study concluded that thyroid dysfunction is common in depressed patients and larger studies are required in this field before TFTs are considered as an integral part of evaluation of these patients.

Keywords: depression; HDRS; ICD-10 DCR Criteria; thyroid dysfunction.

INTRODUCTION

Depressive affect has been reported to be frequent association with hypothyroidism.¹ The most common abnormality in thyroid function testing among patients with depression is a mild elevation in serum thyroxin concentration, which falls with clinical response to treatment.¹ Psychological disturbance of some degree is universal with hyperthyroidism. Depression can be prominent and found with symptoms of agitation rather than depression. In the elderly, an apathetic hyperthyroidism with anergia and mental slowing occurs, classically presenting without the characteristic eye signs of hyperthyroidism.¹

Thyroid dysfunction has been associated with mood disorders. 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.² The prevalence of clinical hypothyroidism in psychiatric patients ranges from 0.5% to 8%.³ Prevalence of depressive symptoms is close to 50% in people with hypothyroidism and 28% with hyperthyroidism.⁴

A hospital based study in tertiary care hospital found a high prevalence of depression and anxiety among hospitalized geriatric medical inpatients as compared to the healthy community dwellers in Nepal.⁵ Different studies were conducted to find out the prevalence of

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thyroid dysfunction. 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.⁶

Another study done in eastern Nepal found that the prevalence of subclinical hypothyroidism amongst the suspected cases was 20.42% which is much higher compared to other parts of the world.⁷ Another study carried out to find out the thyroid levels in depressed patients concluded towards presence of thyroid dysfunction among the depressives which most often characterized as a "Lower Thyroid Syndrome".⁸

The aim of this study was to estimate the prevalence of thyroid dysfunction in newly diagnosed depressed patients attending psychiatry outpatient department of Tribhuvan University Teaching Hospital, Nepal and to find the correlation between the two.

METHODS

This was a cross-sectional study conducted within a period of six months from Dec 11, 2011 to May 14, 2012. The study population comprised of 70 patients aged >15 years selected by simple random sampling technique who attended the Psychiatry OPD of TUTH and were diagnosed with first episode depression. Approval was obtained from the ethical committee of the institutional review board. Informed consent was taken from the patients and their relatives when they were not able to provide consent because of disease severity.

Exclusion criteria included known thyroid disease in past, substance use, other psychiatric diagnoses as psychotic illness, medical co morbidities like Hypertension and pregnant patients. Patients with TFT reports from only TUTH laboratory were included to avoid bias. A self- designed semi structured proforma was devised to obtain the socio- demographic characteristics of the study population.

The diagnosis of depression and its grading as mild, moderate and severe was done on the basis of ICD-10, DCR as developed by the division of Mental Health of the World Health Organization (WHO, 1992). It deals with mental and behavioral disorders and the version is mainly used for research purposes. As a rating scale, Hamilton Rating Scale for Depression (HAM-D) was used for comparison with the clinical diagnosis of depression.

Thyroid function tests were ordered in the lab and were evaluated on follow-up. The normal value of

free T3 range between 4.2-8.1 pg/ml, of free T4 range between 10.0-28.2 pg/ml, and of TSH range between 0.4-4.6 μ unit/ml was taken in the TUTH Biochemistry laboratory. Any value lying outside these values 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.

In cases where patients missed follow- up visits, TFT reports were traced personally by the researcher from the biochemistry laboratory of the hospital. Data were analyzed using SPSS version 16 (Chicago, Illinois, USA). Descriptive analysis was performed, and mean, median, range were calculated. The data were explained as mean \pm standard deviation (SD) wherever suitable. Spearman's rank correlation was performed for ordinal dataset; this was utilized to find out the correlation between thyroid status and severity of depression. Chi- square tests were applied for categorical data. Independent sample t test, ANOVA tests were applied wherever applicable. P- value of <0.05 was considered significant.

RESULTS

A. Patient characteristics

Demography: Mean and SD of age of patients was 30.30 \pm 9.75 years, range: 15-58 years; and 49 (70%) of the total sample were females. Majority of the patients were Hindus, 61 (87.1%). The proportion of illiterate patients and those attending primary school, secondary school, higher secondary school, and university were 14 (20%), 7 (10%), 22 (31.4%), 12 (17.1%), and 15 (21.4%) respectively. Regarding occupation, roughly one in three patients were housewives, 35.7%, and one in five patients were students, 20%. Assessment of socioeconomic status was based on the rough guidelines provided by CBS, government of Nepal. Majority of the sample, 38 (54.3%) was found to be in middle class, followed by lower class, 23 (32.9%) and higher class, 9 (12.9%). Regarding family structure, 43 (61.4%) belonged to nuclear family.

(Table 1) shows socio-demographic variables between patients with and without normal thyroid status were similar (P value not significant).

Table 1. Comparison of socio- demographic variables among normal and abnormal thyroid status patients.

Variables	Normal thyroid status (55) n (%)	Abnormal thyroid status (15) n (%)	P value
Mean age±SD in years	29.49±8.55	33.26±13.20	0.18
Sex			0.75
Male	17 (24.3)	4 (5.7)	
Female	38 (54.3)	11 (15.7)	
Educational status			0.77
Illiterate	10 (14.3)	4 (5.7)	
Primary	6 (8.6)	1 (1.4)	
Secondary	19 (27.1)	3 (4.3)	
Higher secondary	9 (12.9)	3 (4.3)	
University	11 (15.7)	4 (5.7)	
Marital status			0.57
Single	16 (22.9)	4 (5.7)	
Married	36 (51.4)	9 (12.9)	
Separated	3 (4.3)	2 (2.9)	
Religion			0.64
Hindu	49 (70)	12 (17.1)	
Buddhist	3 (4.3)	2 (2.9)	
Christian	2 (2.9)	1 (1.4)	
Others	1 (1.4)	0	
Occupation			0.76
Unemployed	5 (7.1)	2 (2.9)	
Housewife	19 (27.1)	6 (8.6)	
Agriculture	2 (2.9)	0	
Service	8 (11.4)	3 (4.3)	
Business	5 (7.1)	0	
Student	12 (17.1)	2 (2.9)	
Others	4 (5.7)	2 (2.9)	
Type of family			0.76
Nuclear	35 (50)	8 (11.4)	
Joint	12 (17.1)	4 (5.7)	
Extended	8 (11.4)	3 (4.3)	
Socioeconomic status			0.24
Lower	20 (28.6)	3 (4.3)	
Middle	27 (38.6)	11 (15.7)	
Upper	8 (11.4)	1 (1.4)	

B. Types and severity of depression: Majority of patients were having moderate depressive episode without somatic syndrome, 35 (50%). Sixteen patients (22.9%) had moderate depression with somatic syndrome and severe depression was seen in 16 (21.9%). Percentage of patients with mild depression was only 3 (4.3%)(Table 2).

Table 2. Diagnosis on the basis of ICD- 10 Diagnostic Criteria for Research (DCR).

Types of depression	n (%)
Mild Depressive Episode without Somatic Syndrome	3 (4.3)
Moderate Depressive Episode with Somatic Syndrome	16 (22.9)
Moderate Depressive Episode without Somatic Syndrome	35 (50.0)
Severe depressive episode with psychotic symptoms	3 (4.3)
Severe depressive episode without psychotic symptoms	13 (18.6)
Total	70 (100.0)

C. Lab data - Thyroid status: Seventy-ninepercent of patients had normal thyroid function tests; while 11.8% had subclinical hypothyroidism, 5.7% had subclinical hyperthyroidism, and remaining 4.3% had overt hypothyroidism. Thus, 21% of patients had thyroid disorder associated with depression. None of the patients in the sample exhibited overt hyperthyroidism (Table 3).

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

Status of Thyroid	n (%)
Normal	55 (78.6)
Subclinical hypothyroidism	8 (11.4)
Subclinical hyperthyroidism	4 (5.7)
Overt hypothyroidism	3 (4.3)
Total	70 (100.0)

D. HDRS score: HDRS scoring was done in the OPD by the attending physician. As shown in figure 1, majority of patients had moderate depression based on this scale. The percentage of patients having mild, moderate, severe, and very severe depression was 4 (5.7%), 39 (55.7%), 12 (17.1%), and 15 (21.4%) respectively (Figure 1). Mean value of HDRS score was 19.1±5.81 (range:8.0-33.0).

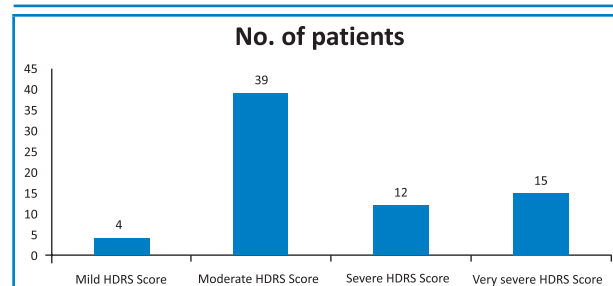


Figure 1. Bar diagram representing severity of depression based on HDRS score.

Correlation between types of depression and thyroid status: Our study revealed that there was positive correlation between types of depression and thyroid status ($r= 0.530, P=0.003$). There was positive correlation between depression level (HDRS level) and thyroid status ($r= 0.407, P=0.008$); and there was positive correlation between types of depression and HDRS ($r= 0.493, P=0.007$)(Table 4).

Table 4. Analyzing correlation between 1) Types of depression 2) Thyroid status 3) HDRS: Spearman's correlation (r) between three different variables.

Variables	Thyroid status	Type of depression	HDRS level
Thyroid status	1.0		
Type of depression	.530*	1.0	
HDRS level	.407*	.493*	1.0

*P<0.05

DISCUSSION

Prevalence of depressive symptoms is close to 50% in people with hypothyroidism and 28% with hyperthyroidism.⁴ Only a few studies have been done in our part to find out the thyroid levels in depressed patients. Das et al concluded towards presence of thyroid dysfunction among the depressives which most often characterized as a “Lower Thyroid Syndrome”.⁸ Our study is aimed to estimate the prevalence of thyroid dysfunction in depressed patients and it will be beneficial for the treating psychiatrists to be cautious in cases of treatment resistant depression as well.

Mean age of patients was 30±9.75 years; and 70% of the total samples were females. This can be explained by the fact that the common age group for depression is middle age with 50% occurring in the 20 to 50 years age group. The two fold greater prevalence of major depression in females as compared to males is comparable with universal observation, independent of country or culture. Community surveys of symptoms of anxiety and depression have generally indicated a female: male ratio of 2:1,⁹ a finding supported by the large-scale epidemiological Catchment Area (ECA) survey carried on in the US. In our study, it is even more than double which could be due to greater number of female respondents.

Majority of patients (50%) were having moderate depressive episode without somatic syndrome while only 4.3% patients presented with mild depression. Almost

one in five patients attending OPD was found to suffer from severe depression. These results are in accordance with the prevailing literature that it is mainly the moderate depressions that are mostly diagnosed in out- patient basis. Mildly depressed people usually do not seek medical help while severely depressed people usually go to Emergency for help.

Our study showed 21% point prevalence of thyroid dysfunction in depressed patients attending psychiatry OPD. None were found to have overt hyperthyroidism while, among the thyroid dysfunction group, 11.4% had subclinical hypothyroidism, 5.7% had subclinical hyperthyroidism, and remaining 4.3% had overt hypothyroidism. This is in accordance with the studies by other authors who found one to 4% prevalence rate of overt hypothyroidism and 4% to 40% of subclinical hypothyroidism in his patients with affective disorder.¹⁰

Another study by a group of researchers discovered a 12% rate of hypothyroidism in depressed inpatients.¹¹ Some studies found that hyperthyroidism rather than hypothyroidism is associated with the presence of depression in young adults as evidenced by low TSH level and high T4 level though the exact prevalence estimates is not known.¹² The findings of our study are in accordance with previous study done in Nepal which found 19.34% prevalence of thyroid disorder among patients with depression.⁸ Another group found no association between depression and hypothyroidism.⁴ Contradictory findings were seen in other studies where the vast majority of patients with depression do not have biochemical evidence of thyroid dysfunction.^{13,14} Despite the prevailing discrepancies in the reported frequencies, our study shows that thyroid dysfunction is common in patients with newly diagnosed depression.

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. So, the findings of this study cannot be generalized in the general population.

CONCLUSIONS

Point prevalence of thyroid dysfunction among newly diagnosed depressed OPD patients was found to be 21% and there was significant association between thyroid dysfunction and depressive disorder in terms of severity. Larger scale studies are required in this area to replicate these findings so that TFTs can be considered as an integral part of evaluation of newly depressed patients.

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