

Prevalence of Thyroid Dysfunction and its Relationship with Severity of Depression among Patients of Depression Attending Tertiary Hospital

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ABSTRACT

Background: Thyroid dysfunction is common feature among patients presenting with depression. The aim of this study was to estimate the prevalence of thyroid dysfunction in patients with depression attending Psychiatry outpatient department of College of Medical Sciences and Teaching Hospital, Chitwan, Nepal and to investigate its relationship with the severity of depression.

Methods: A total of 259 who attended the Psychiatry OPD of College of Medical Sciences and Teaching Hospital were enrolled over a period of 6 months after taking informed written consent. These patients were diagnosed as depression as per the ICD-10/ DCR criteria. The severity of illness was determined by using HAM-D. Thyroid profiling was done against common thyroid hormones TSH, FT3 and FT4 by standard method. Data was analyzed using SPSS.

Results: Among 259 patients, thirty patients (18.40%) were found to have thyroid dysfunction, sub-clinical hypothyroidism was seen in 23 (14.1%) followed by 3.1% with overt hypothyroidism and 1.2% with overt hyperthyroidism. However, there was no significant association found between severity of depression and thyroid dysfunction.

Conclusions: This study concluded that there was high prevalence of thyroid dysfunction in patients with major depression. Thus screening of thyroid test among depressive patients may be helpful in proper management of cases.

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

INTRODUCTION

Depression is a common illness worldwide, with more than 300 million people affected.¹ The WHO has ranked depression the 4th leading cause of disability worldwide and projects that by 2020, it will be the second leading cause.² The average life time prevalence of major depressive disorder is 12%.³ It is estimated that 10 to 25 % of women and 5 to 12 % of men suffer from a major depression during their lifetimes.³ Studies have shown association between thyroid function disorder and depression. Similarity of symptoms in severely depressed and hypothyroid patients, the therapeutic use of thyroid hormones in the management of depression and the apparent abnormalities in the hypothalamic-pituitary-thyroid axis of subjects with depression has led to an observation of the association.⁴

Primary thyroid disorders including both hypothyroidism and hyperthyroidism may be accompanied by various neuropsychiatric manifestations ranging from mild depression and

anxiety to overt psychosis. Dysphoria, anxiety, irritability, emotional lability and impairment in concentration constitute the classical neuropsychiatric symptoms occurring in hyperthyroidism or thyrotoxicosis.⁵ On the other hand, hypothyroid patients frequently demonstrate features of depression, cognitive dysfunction, apathy, and psychomotor slowing. In severe forms of hypothyroidism, clinical symptoms may mimic that of melancholic depression and dementia.⁶ When thyroid abnormalities exist, they consist mainly of elevated T4 levels, low T3, elevated rT3, blunted TSH response to TRH, positive antithyroid antibodies and elevated cerebrospinal fluid (CSF) TRH concentrations. This could result from a defect in the thyroid hormone receptor,⁷ or in the thyroid hormone transport and uptake into the brain and neuronal cells.^{8,9} The prevalence of depressive symptoms in hypothyroidism is near to 50% whereas in hyperthyroidism it reaches up to 28% of the cases.¹⁰ In psychiatric populations, the rate of clinical hypothyroidism ranges from 0.5 to

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8%.¹¹ There are few studies which have examined the prevalence of thyroid dysfunction in major depressive patients in Nepal. Ojha et al, performed a cross-sectional study to examine the prevalence of thyroid dysfunction in depressive patients had found that 21% of depressive patients had abnormal thyroid function tests, 11.8% had subclinical hypothyroidism, 5.7% had subclinical hyperthyroidism, and the remaining 4.3% had overt hypothyroidism.¹² Study conducted in Nepal showed that 42.8 % of depressive patients were having some form of thyroid dysfunction with 28.5 % having subclinical hypothyroidism.¹³ This research aims to examine the prevalence of thyroid dysfunction in patients with major depressive disorder and to explore if there is any relationship between the two.

METHODS

This study is a hospital based-cross sectional descriptive study conducted in College of Medical Sciences and Teaching Hospital, in Chitwan district of Nepal, over a period of 6 months from July 2019 to December 2019. All patients with unipolar depression from outpatient department fulfilling the inclusion criteria were enrolled after informed written consent. A total of 259 unipolar depression patients were included. Ethical clearance was

obtained from the ethical committee of the institutional review board of COMSTH. Patients of the age group 18-65 years, irrespective of their genders, diagnosed of unipolar depression as per ICD 10/DCR criteria, were included. While, patients with co morbid medical illness or any other psychiatric disorder were excluded.

Tools

A semi structured proforma was used for the assessment of the socio-demographic and clinical variables of the patients. Diagnosis of depression was made using ICD-10/DCR criteria. 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. The normal value of free T3 range between 1.21-4.18 pg/ml , free T4 range between 8.9-17.2 pg/ml and of TSH range between 0.3 -4.5 microunits/ml was taken in the COMSTH Biochemistry laboratory. Thyroid function test panel were assayed by the Chemiluminescent Immuno Assay technique using standard kit.

Definition of thyroid status

Euthyroidism was defined as normal freeT3, freeT4 and TSH. Abnormal thyroid status was

Table 1. Socio- demographic characteristics of patients.

Variable	Normal thyroid status (n=185)	Abnormal thyroid status (n= 74)	P value
Mean Age ± SD in years	35.41±14.50	35.29±14.48	0.955
Sex			0.008
Male	69 (26.64%)	15 (5.79%)	
Female	116 (44.78%)	59 (22.79%)	
Marital status			0.531
Married	132 (50.96)	55 (21.23%)	
Unmarried	51 (19.69%)	19 (7.33%)	
Separated	2 (0.77%)	0 (0%)	
Education			0.077
Illiterate	59(23.31%)	34 (13.12%)	
Primary	11 (4.24%)	0 (0%)	
Secondary	43 (16.60%)	20 (7.72%)	
SLC	6 (2.31%)	0 (0%)	
Intermediate	42 (16.21%)	12 (4.63%)	
Graduate	23(8.88%)	1 (3.08%)	
Upper	15 (5.79%)	0 (0%)	
Socioeconomic status			0.008
Middle	136 (52.50%)	53 (20.46%)	
Lower	34 (13.12%)	5 (3.06%)	
Occupation			0.011
Unemployed	5 (1.93%)	3 (1.15%)	
Housewife	78 (30.11%)	44 (16.98%)	
Business	25 (9.65%)	3 (1.15%)	
Farmer	18 (6.94%)	5 (1.93%)	
Laborer	12 (4.63%)	5 (1.93%)	
Service	23 (8.88%)	3 (1.15%)	
Student	22 (8.49%)	11 (4.24%)	
Others	2 (0.77%)	0 (0%)	
Type of family			0.044
Nuclear	174 (67.18%)	64 (24.71%)	
Joint	11 (4.24%)	10 (3.86%)	
Religion			0.336
Hindu	175 (67.56%)	73 (28.18%)	
Buddhist	5 (1.90%)	0 (0.00%)	
Christian	2 (0.77%)	0 (0.00%)	
Muslim	3 (1.15%)	1 (0.38%)	

further categorized as overt hyperthyroidism if there was elevated level of free T3, free T4 and decreased TSH, and overt hypothyroidism, as having decrease in level of free T3 and free T4, with high TSH. Subclinical hypothyroidism as by normal free T3, normal free T4 and elevated serum TSH level and subclinical hyperthyroid as decreased TSH and normal free T3 and free T4.

Statistical analysis

The collected data were entered in Microsoft Excel, tabulated and analyzed using SPSS (23.0 Version). Statistical analysis was done using parametric and nonparametric statistical techniques for measure of central tendency and standard deviation; correlation between thyroid status and severity of depression was analyzed using Pearson correlation. Statistical significance was assessed at 5% level of significance (p<0.05).

RESULTS

Among the 259 patients enrolled with a major depressive disorder in the study, 84 (32.4%) were male, while 175 (67.6%) were female. The mean age of the participants was 35.37 years. Majority of them 187 (72.2%) were married and followed Hindu religion, 248 (95.8%). Most of them, 93 (35.90%) were illiterate. Assessment of socioeconomic status was based on the guidelines provided by Central Bureau of Statistics, government of Nepal. Majority of patients belonged to middle socioeconomic condition, 189 (73.0%). The major occupation of most participants 122 (47%) housewives and stayed in a nuclear family, 238 (91.9%). Demographic data is shown in Table (1).

Of 259 participants, 74 (28.57%) had a thyroid dysfunction. Sixty four patients had subclinical hypothyroidism, five had overt hypothyroidism, four (1.5%) overt hyperthyroidism and one had subclinical hyperthyroidism (Table 3). The characteristics of the subjects who had thyroid dysfunction and normal thyroid function are shown in Table (1). Majority of patients had moderate depressive episode without somatic syndrome, 96 (37.1%), thirty two patients (12.4%) had moderate

Table 2. Diagnosis of patients on the basis of ICD-10/DCR criteria.

Mild depressive episode without Somatic syndrome	62 (23.9%)
Mild depressive episode with Somatic syndrome	15 (5.8%)
Moderate depressive episode without Somatic syndrome	96 (37.1%)
Moderate depressive episode with Somatic syndrome	32 (12.4%)
Severe depressive episode without Psychotic symptoms	31 (12.0%)
Severe depressive episode with Psychotic symptoms	23 (8.9%)

depression with somatic syndrome and seventy seven (29.72%) had mild and severe depression was seen in 33 (20.84%) Table (2). The results demonstrated no significant association between thyroid dysfunction with the severity of depressive illness and HAMD (Table 4).

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

State of Thyroid	N (%)
Euthyroidism	185 (71.4%)
Subclinical Hypothyroidism	64 (24.7%)
Subclinical Hyperthyroidism	1 (0.4%)
Overt Hypothyroidism	5 (1.9%)
Overt Hyperthyroidism	4 (1.5%)

Table 4. Correlation between thyroid status, type of depression and HRDS: Pearson's correlation.

Variables	Thyroid status	Type of depression	HDRS levels
Thyroid status	1.0		
Type of depression	0.064	1.0	
HRDS	0.106	0.866*	1.0

DISCUSSION

In our study the mean age of the patients was 35.37±14.47 years. Among them almost two-third of the population were female. These findings were similar to the earlier studies where majority of patients were middle aged female.^{13, 14}

The prevalence of thyroid dysfunction in our study was 28.57%. This value is higher when compared with some of the studies done in general population with a range of 1-10.¹⁵⁻¹⁷ However, when compared to the studies done among the patients with major depressive disorder the findings are similar. Study done by Das et al had a prevalence of 19.4%,¹⁸ Charnsil et al showed prevalence of 22.1%,¹⁹ and Ojha et al had 21%¹³ prevalence of thyroid disorder among patients with depression.

Among those with thyroid dysfunction, 24.7% patients had subclinical hypothyroidism, 1.9% had overt hypothyroidism, 1.5% had overt hyperthyroidism and 0.4% had subclinical hyperthyroidism. This is in accordance with the study done by Ojha et al which found the prevalence of subclinical hypothyroidism being 11.4%, subclinical hyperthyroidism 5.7% and overt hyperthyroidism 4.3%.¹² Similar findings were found in studies which showed 1% to 4% prevalence rate of overt hypothyroidism and 4% to 40% of subclinical hypothyroidism in his patients with affective disorder.^{20,21}

Majority of patients (49.42%) had moderate depressive episode, while 29.72% had mild and 20.84% presented with severe depression. These findings are in concordance with the previous studies.^{12,13} The study showed that there is positive correlation between severity of depression and

HAM-D scores however there was no correlation between severity of depression and thyroid disorder which is similar to the findings of Charnsil et al.¹⁹ However this is in contrast to the finding of Ojha et al which showed a positive correlation between severity of depression and thyroid dysfunction.¹²

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CONCLUSIONS

This study concluded that there was high prevalence of thyroid dysfunction in patients with major depression. Thus screening of thyroid test among depressive patients may be helpful in proper management of cases.

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