A Study of Thyroid Dysfunction among Patients Diagnosed as Depressive Episodes Presenting in the Psychiatry OPD at a Tertiary Care Hospital in Pokhara

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ABSTRACT

Background

The prevalence of thyroid dysfunctions is not clear in depression, and more studies are needed.

Objective

To find the prevalence of thyroid dysfunctions among patients diagnosed with depressive episodes. The second objective was to test the association between thyroid dysfunctions and different sociodemographic variables.

Method

The patients diagnosed with depressive episodes according to the International Classification of Disease – 10 Classification of Mental and Behavioural Disorders (Diagnostic Criteria for Research) were selected from the Psychiatry Out-Patient Department of Manipal Teaching Hospital, Pokhara. The pro forma was used to collect the socio-demographic profile of the patient. The serum sample of the 398 patients was sent for thyroid estimations.

Result

The overall prevalence of thyroid dysfunction was 13.07%. The mean age of the abnormal thyroid function patients was 44.88 years with a standard deviation of 13.39 years. Thyroid dysfunction was more prevalent in the socio-demographic variables like female gender and in the patients living in the rural area as compared to other variables, but in a statistically insignificant way.

Conclusion

The result shows that thyroid dysfunction is common in the patients with depression. Clinicians should screen every depressive patient for thyroid function. Further larger-scale studies are needed before generalizing these results.

KEY WORDS

Depression, Hypothyroidism, Nepal, Thyroid Dysfunction

INTRODUCTION

Thyroid disorders are the most prevalent medical conditions worldwide, with 1.6 billion people at risk and 2.2 billion people affected by iodine deficiency throughout the world.[1] Thyroid dysfunction is also a major health problem in Nepal, with a prevalence of nearly thirty percent.[2] The pattern and prevalence of thyroid disorders depend on ethnicity and geographic and environmental factors, including iodine intake status.[2,3] Nepal lies in a mountainous, landlocked area of endemic iodine deficiency. This factor leads to a very high incidence of iodine deficiency disorders.[4]

Depressive affect has been reported to be a frequent association with hypothyroidism.[5] The most common abnormality in the testing of thyroid function among patients with depression is a mild elevation in serum thyroxine concentration, which falls with clinical response to treatment.[6] Serum TSH response to thyrotropin-releasing hormone is blunted in 25% of depressed patients, and the nocturnal surge of TSH is lost in depression, returning to normal with recovery.[6]

The different studies found prevalence of thyroid dysfunction ranging from 19.35% to 42.85% in the patients diagnosed with depressive episodes.[7-13] It is estimated that 20 to 26% of women and 8 to 12% of men suffer from a major depression during their lifetimes.[14] In 2019, depressive disorders accounted for 46.86 million (95% UI 32.93-63.80) Disability-Adjusted Life Year (DALY) globally, equating to an age-standardized DALY rate of 577.75 (405.79-788.88) per 100,000.[15]

Thyroid hormones have profound effects on mood and behaviour, and seem to be able to modulate the phenotypic expression of major affective illness.[16] Although the role that is played by the thyroid hormones in the pathophysiology of mental disorders is not clear, it has been suggested that small changes in the thyroid hormone levels, even within the normal range, may be related to the altered brain function in mood disorders. The literature data on the plasma hormone values in patients with depression are controversial. In view of this, the present study was done in order to contribute to a better understanding of the relationship between thyroid activity and mood disorder. There are limited studies describing the prevalence rates of thyroid dysfunction in depression in Nepal. The objectives of this study are to estimate the prevalence of thyroid dysfunction in the patients suffering from depressive episodes. The second objective is to test the association between the different sociodemographic variables of the patients diagnosed with depressive episodes and thyroid dysfunction.

METHODS

The ethical clearance of this cross-sectional study was taken from the Institutional Review Committee of Manipal College of Medical Sciences, Pokhara before the start of the study. The study was conducted for twelve months (from January 2023 to December 2023). The study was conducted in the Psychiatry Outpatient Department (OPD) of Manipal Teaching Hospital, which is situated in Pokhara, the capital of the Gandaki Province of Nepal. The total of 398 drug-naïve patients who had fulfilled the diagnostic criteria of depressive episode (single episode or recurrent episode) according to ICD-10 Classification of Mental and Behaviour Disorder Diagnostic Criteria for Research (ICD-10 DCR) was selected by the convenience sampling method.[17]

The sample size was calculated by using the following formula:

$N = Z^2 \times p \times q/e^2$

$= (1.96)^2 \times (0.4285 \times 0.5715)/ (0.05)^2$

= 376.30 (377 patients)

where,

n= sample size

Z= 1.96 at 95% CI

p= prevalence, 42.85%[7]

q= 1-p

e= margin of error, 5%

By adding 21 more samples (5.57% as non-response rate), the final sample size was calculated to be 398.

The consent was taken from the patients. The patients who were diagnosed with bipolar affective disorder, known cases of thyroid dysfunction, comorbid medical/surgical conditions, and the patient who had not given informed consent were excluded from the study. Similarly, the patients who were pregnant, taking any other drugs/medicine on regular basis, and any history of having undergone gastrointestinal tract surgery in the past were also excluded from the study.

The normal value of free T3 ranges between 2.77-5.27 pg/ml, of free T4 ranges between 0.78-2.19 ng/dl, and of TSH ranges between 0.46-4.68 µIU/ml. Any value lying outside these values was considered abnormal, and the values of free T3, free 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.

The data were entered and analyzed in the Epi-info program. The statistical methods used were percentage for finding the prevalence of thyroid dysfunction. The difference in mean age of two samples, i.e., between the

normal and abnormal thyroid status, is tested by a t-test. The relationship between gender and residence and thyroid status is tested by the chi-square test. Odds ratios were used to measure the strength of association between gender and residence and thyroid status. The p-value of less than 0.05 was considered significant.

RESULTS

Table 1 showed the thyroid status of the depressive patients. The overall prevalence of thyroid dysfunction was 13.07% in the patients diagnosed with depressive episodes according to ICD-10 DCR.

Table 1. Frequency of thyroid status of the patients.

Thyroid Level		Number	Percentage
Abnormal	Overt Hyperthyroidism	2	0.50
	Overt Hypothyroidism	21	5.28
	Subclinical Hyperthyroidism	2	0.50
	Subclinical Hypothyroidism	27	6.78
	Total	52	13.07
Normal		346	86.93
SUM TOTAL		398	100.00

Table 2 showed the comparisons between different variables and the thyroid status of the patients. The mean age of the thyroid dysfunction patients was 44.88 years and normal thyroid function was 40.26 years, but this was statistically insignificant. The thyroid dysfunction was more noticed in females as compared to males. The thyroid dysfunction is also more prevalent in the patients from the rural background as compared to urban residents. However, the association between the different variables and abnormal thyroid function was not found to be statistically significant.

DISCUSSIONS

Thyroid dysfunctions are common among patients with depression and carry bad prognosis if not detected. This study is an attempt to study the thyroid dysfunction in depression.

The prevalence of thyroid dysfunction in the present study was 13.07% (Table 1). The different studies found prevalence of 19.35%, 20%, 21%, 26.2%, 28.57%, 33.84% and 42.85%.[7-13] Among thyroid dysfunction in this study, subclinical hypothyroidism was the most common manifestation (Table 1). The different studies conducted in Nepal also found subclinical hypothyroidism as the commonest type of thyroid dysfunction among patients.[7,10-13] One study found overt hypothyroidism as the most common diagnosis.[8] Overt hypothyroidism is the second most common thyroid dysfunction in our study (Table 1). Similar was the result of the findings according to the different studies conducted in Nepal.[7,11-13] However, other studies conducted in Nepal found subclinical hyperthyroidism and subclinical hypothyroidism as the second most common thyroid dysfunction.[8,14] Some previous studies suggested that the thyroid function of depressed patients is within the normal range while overt thyroid dysfunction is extremely uncommon.[18-20]

Table 2. Comparison of variables between normal and abnormal thyroid status patients.

Variables		Abnormal thyroid status No. (%)	Normal thyroid status No. (%)	Total No. (%)	Odds Ratio	95% CI	p-value
Mean Age ± SD		42.88±13.39	40.26±13.79	40.60±13.75			0.140
Gender	Female	37 (14.07)	226 (85.93)	263 (100.00)	1.30	0.69, 2.48	0.436
	Male	15 (11.11)	120 (88.89)	135 (100.00)			
Residence	Rural	39 (14.72)	226 (85.28)	265 (100.00)	1.59	0.81, 3.09	0.207
	Urban	13 (9.77)	120 (90.23)	133 (100.00)			

The mean age of patients with abnormal thyroid findings was 42.88 years in this study (Table 2). The other studies found mean ages of 33.26 years and 36.0 years which are lower than the present study.[7,10] However, one study found a mean age of 41.03 years which is almost similar to our study findings.[21] There is no statistical difference between the mean age of normal and abnormal thyroid status patients in this study (Table 2). The other studies conducted in Nepal also found no statistically significant difference between the mean age of normal and abnormal thyroid status patients.[7,10]

The prevalence of thyroid dysfunction was noticed more in females than males in the present studies, but the association was statistically insignificant (Table 2). The other studies also found the female preponderance in their study findings.[7,8,21] One study found slightly more prevalence of thyroid dysfunction in males, but in a statistically insignificant way.[10]

Table 2 shows that the prevalence of abnormal thyroid function was found more in the patients living in the rural area. One study also found more patients from rural areas in their study.[9] The other researchers had not measured this variable in their studies.

The difference in the prevalence rates in the above studies might be due to differences in the geographical location of the respondents. The different results of the different studies might be because these studies failed to consider other potential confounding factors, such as the iodine intake status of the respondents, which might lead to abnormal thyroid function. The different results might also be due to differences in study design, different cut-off values, and confounding factors in various studies.

The study has few limitations. The cross-sectional nature of the study is the obvious limitation of this study. Hence, this study does not check the direction of the effect. The second limitation is that the study was hospital-based. Further large-scale studies are needed before generalizing the findings of this study to the general population.

CONCLUSION

The present study concludes that there is a prevalence of thyroid dysfunction of 13.07% among the patients suffering from depression, and the most common thyroid dysfunction is subclinical hypothyroidism. The prevalence is more noticed in the female gender and in the patients from the rural background, although in a statistically insignificant way. There is also no statistical significance between the mean age of thyroid normal and abnormal patients. The risk factors detected in this study, e.g., female gender and patients from the rural areas, should be given special focus while searching for thyroid dysfunction. The study highlights the important aspects of screening for thyroid function in the approach to the depressive cases. The studies from different geographical areas are needed before generalizing these findings to the general population.

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